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HYDROGEN: FUEL FOR THE FUTURE

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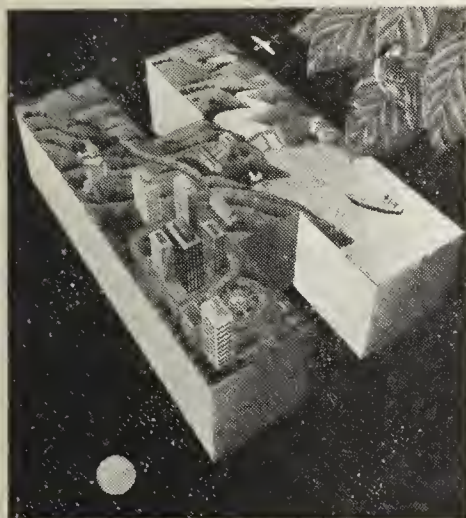
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GRADUATE



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THE SILENT CANADIAN



The initial reactions of the Canadian government to the imposition of martial law in Poland aroused anger and disbelief in many Canadians. Successive statements by the prime minister, the minister for external affairs, and anonymous spokesmen for that department avoided “*a priori* condemnation of the military régime” and seemed to condone the use of military measures and to absolve Moscow of responsibility. Martial law, it was variously argued, *might* be justified in view of Solidarity’s “excessive demands” and in preference to “civil war” or to “Soviet intervention”. Trudeau and his aides seemed insensitive to the tragedy being enacted in Poland and unresponsive to opinion in Canada and the West. At the NATO meeting in Brussels in January 1982, however, Canada associated itself with a stronger and clearer statement of allied views. In February, it was, ironically, Canadian delegates, at Geneva at the Human Rights Commission, who took the lead in expressing Western concern over events in Poland. In the face of an open threat to détente and to security in Europe, Canadian diplomacy seemed vacillating and inconsistent and incapable of formulating a course of action appropriate to the situation.

In the judgement of informed observers in the West and in Poland there was no danger of civil war, or even of anarchy or chaos in Poland. Only the government of the Soviet Union, fearful of any change within its European bloc, and its conservative henchmen in Poland and Eastern Europe, regarded the measures of democratization taken in Poland as “counter-revolutionary”. There was indeed a serious political crisis in Poland which had resulted from the long-standing economic crisis, the popular pressures for urgent reform and the reluctance of party and government to proceed firmly in this direction. Solidarity, having vindicated the right to form an independent trade union, served as a catalyst for drastic change in all spheres of Polish life and its program enjoyed the support of the overwhelming majority of the population and of all major social groups — peasants, students, intellectuals, the Church, and some circles within the communist party. Poland was experiencing a virtual revolution, but one that was non-violent and “self-limiting” in the sense that it did not seek to oust the ruling party, overthrow the existing system or change Poland’s orientation to the Soviet bloc. The increasing militancy and politicization of Solidarity expressed the popular mood and reflected the ever deepening economic crisis and the growing distrust of the intentions of the régime. Lech Walesa, although flanked by more militant associates, remained firmly in control of the movement and sought to implement a responsible and relatively moderate course.

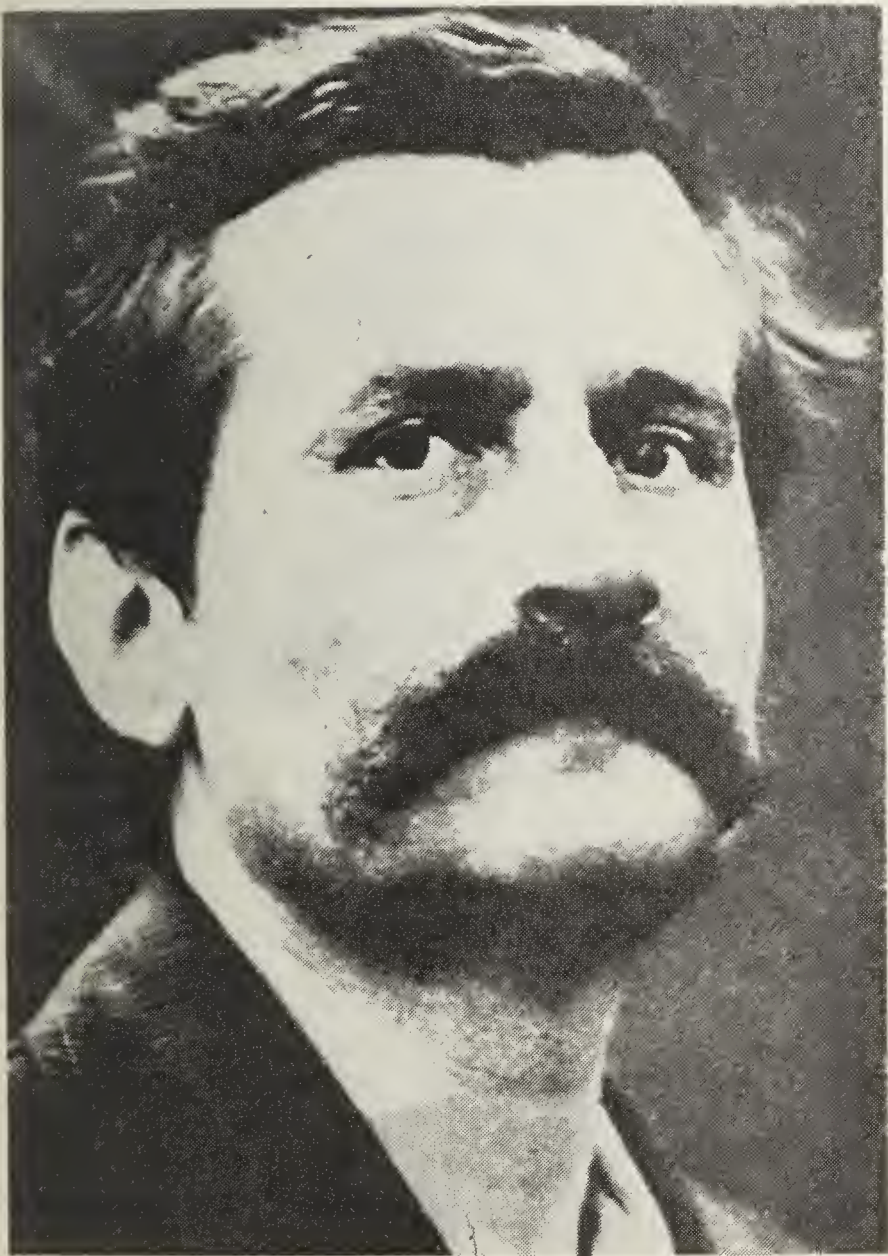
The party’s leadership, on the other hand, its legitimacy undermined in previous crises in 1970 and 1976, had lost all vestiges of public confidence by its failure to carry out the Gdansk agreement which had brought Solidarity and the movement of “renewal” into being, and by its slowness in

introducing the urgent measures required to meet the crisis. Had the Warsaw régime been genuinely committed to reform, it would have acted more swiftly and decisively in forging a real partnership with Solidarity and the Church and in enlisting public participation in the implementation of an agreed program. In fact, General Jaruzelski, head of the party, government and army, was not a “reformer” at all, and with the support of conservative elements in the party, strove to resist popular pressures for basic change. In the end he seized power by armed force, not to ward off anarchy or civil war but to buttress the party’s disintegrating rule and to block reform.

As for the Soviet role, there can be no doubt of Moscow’s involvement at every step — both in the establishment of the system which was responsible for repeated crises, and in its persistent hostility to fundamental reform. During the 18 months after Gdansk the Soviet régime expressed its opposition to the process of “renewal” in the mass media and in official utterances, and sought to discourage the Polish party and the populace from pursuing reform by troop movements and military manoeuvres within and without Polish borders. The failure of the Soviet leaders to intervene by armed force, as in Czechoslovakia in 1968, was due not to any “tolerance” on their part, but to their recognition of the high price to be paid (the likelihood of massive popular resistance, the heavy economic burden, and the blow to détente and its economic benefits) and to their hope that the Polish régime would in the end do the job itself. In the light of the tight co-ordination of army and police within the Soviet bloc, and the intimacy of inter-party relations, it is most likely that the introduction of martial law was effected in closest consultation between Warsaw and Moscow, and perhaps even at direct Soviet command. If, as some have suggested, Jaruzelski acted on his own to avert a Russian military intervention and to preserve a vestige of Polish sovereignty, he did so almost certainly with Soviet approval and in the knowledge of an impending armed intervention otherwise.

The military crackdown was a flagrant violation of international laws and agreements, most notably of the Helsinki Final Act. This point was made in many official Western statements, including those by most Western (and even by some neutral) delegates in the closing days of the Madrid conference in mid-December (Canada did not speak on that occasion!). The continued pressures by the U.S.S.R. on Poland since August 1980 constituted a blatant interference in her domestic affairs and a threat of the use of force, both contrary to the principles of Helsinki. The liquidation of all civil rights and freedoms, laboriously achieved since Gdansk, was equally a breach of Helsinki, as well as of the international human rights covenants and of International Labor Organization conventions. Silence in the West in the face of this denial of human rights and threat to security would have constituted a disavowal of Helsinki and a return to the worst aspects of Yalta.

The Western response to Polish military rule was slow, half-hearted and disunited. It took two weeks for the United States to embark on a unilateral program of limited sanctions. Another two weeks passed before NATO issued a joint condemnation of Poland and the Soviet Union and agreed in principle on sanctions. A month later, when Solidarity had been destroyed and the military régime firmly entrenched, Reagan's television "spectacular" contributed little or nothing to an improvement of the situation. Strong denunciation of the Polish régime at the Geneva meeting of the Human Rights Commission and at the re-opening of the conference on security and co-operation in Madrid was more substantial. At the time of writing [early February] it was clear that a more effective response was required and could not be long delayed.



There seemed no escape from embarking on a broader program of sanctions by all members of the NATO alliance, including Canada, implemented perhaps step by step, with increasing severity at each stage. Crucial would be the termination of large-scale lending to Poland, even at the risk of her default, coupled with governmental measures to avert a Western financial crisis. Equally critical would be a grain embargo, together with Western governmental support for the purchase and sale of unused grain, and emergency private shipments of food and medicine to the Polish people. These measures would be costly to Western governments and to their citizens, and would, alas, intensify the suffering of the Polish people. They would, however, transfer the responsibility for dealing with Poland's desperate economic crisis squarely where it belongs, to the Warsaw régime and to the Soviet Union and other bloc members. The latter,

whose economies are in dire straits and have already been hard hit by the economic collapse in Poland, would pay a heavy price for rescuing their comrades in distress.

There can be no gainsaying that this would represent a return to the policy of confrontation, threatening what is left of détente and even endangering the prospect of arms control. Is there an alternative?

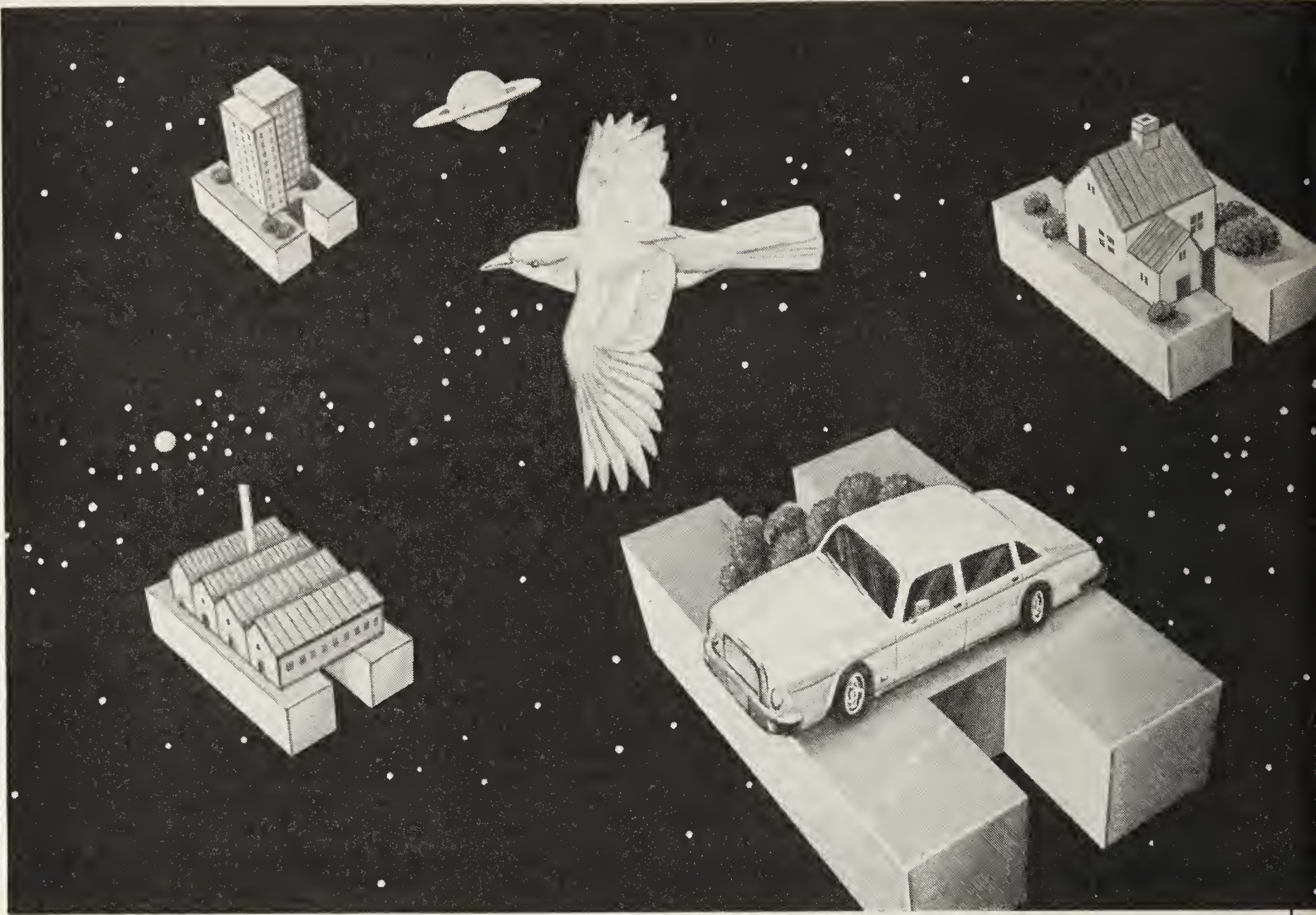
Prior to the military take-over, it was generally believed that a solution to the Polish crisis required two essentials — at home, a partnership of party, Solidarity and Church on an agreed reform program, and abroad, a massive international plan to deal with Poland's debts and to provide additional credits urgently needed for recovery. The offer of such a "Marshall plan" might have averted the resort to martial law and still offers, in theory, an alternative to sanctions. Yet it would be inconceivable that Western governments and their publics would embark on such a program as long as thousands are in prison, there is no dialogue between party, Solidarity and the Church, and no evidence of an intention to carry on with basic reforms promised but barely begun before December 1981. Only such a change of course would restore public confidence in the government and create an atmosphere favourable to the revival of the economy; only this would justify external aid in Western public opinion. Unfortunately it was precisely such a reform by consensus that martial law was designed to prevent. It becomes increasingly hard to believe that the military régime, having successfully attained its goal by *coup d'état*, would suddenly reverse its course and return to the *status quo ante*.

Yet the choice remains — for those in a position to make it in Warsaw and Moscow. Hard-liners now in control in both capitals no doubt prefer to continue the present course: repression; economic austerity; no concessions at home or to the West; increased Polish dependence on the Soviet Union — and all this at the risk of new upheavals in Poland and new threats to bloc unity. Yet there are more conciliatory forces in the Polish Communist Party and perhaps even within the Soviet party, who recognize the difficulties of solving Poland's economic problems without some degree of popular support and Western assistance, and might be encouraged by the penalty of sanctions and the benefits of Western aid, to seek a relaxation of authoritarian rule. They would no doubt be supported by the Church and a liberated Solidarity in pursuing a moderate course of reform. If this were attempted by Poles alone, it would meet with Soviet obduracy and perhaps bring about a Soviet military intervention. It might therefore have to await a shift of policy in Moscow, perhaps with a change in leadership after Brezhnev's fall or death.

Canadians cannot affect the choices made in Warsaw and Moscow directly. With their allies they can, however, contribute to the slow and perhaps long-run process of change in Eastern Europe, sharing the costs and the risks of a firm allied policy of carrot and stick as outlined above. The Canadian government has at its disposal a goodly body of informed and concerned opinion within its own public service and among its citizens, and need only exercise leadership by tapping these resources and making clear the issues and alternatives which face it.

— H. Gordon Skilling

H. Gordon Skilling is a professor of political science in the Department of Political Economy and holds appointments at the Centre for Russian & East European Studies and Centre for International Studies.



FUEL FOR THE FUTURE

BY JUDITH KNELMAN

"WE HAVE ONLY ABOUT 100 YEARS TO FIND ANOTHER WAY TO SURVIVE," SAYS DAVID SCOTT. THE ANSWER, HE BELIEVES, IS HYDROGEN

One year when David Scott was chairman of the Department of Mechanical Engineering at U of T in the late, austere, '70s, his budget for equipment was \$50. That didn't bother him: he and his colleagues went out and got what they needed directly from government and industry. One of his goals from the beginning of his career 20 years ago has been to forge strong links with the most obvious beneficiaries of the research that goes on at universities.

Another is to increase the range of beneficiaries. Professor Scott thinks researchers should be redirecting their efforts to projects that can answer the needs of the community. It's time for them to pay back the investment the community has made in the development of their intellectual potential, he says. "Universities in Canada are now doing a good job of

educating people. They're doing a moderately good job of making contributions to fundamental research. However, they're doing an abysmal job as far as technology transfer is concerned, working with industries to develop new products for benefits that can accrue to all Canadians."

There are opportunities for this sort of transfer that have never existed before, he says, because just as the number of people who want to be educated is going down the need of the country to develop the standard of living and the environment is going up. "This is an astonishingly privileged time to be living in," Scott says. "It's taken 100 or 150 years to get here, by digging up all those fossils." He explains that fossil fuels have been consumed by a civilized society whose priority has been to develop the brain. If burning the midnight oil has all but depleted our supply of



oil, it has also equipped us with the intellectual resources to find a way out of our dilemma. Now it's time for Canada to mine its intellectual resources to fuel its industries so that an alternate fuel can be found and our environment cleaned up.

"There's a need for this country to develop secondary and tertiary industries," he says. "The wealth of this country has been generated by resource industries. You dig something out of the ground or grow things in it, and you grow wealthy. But you can create more wealth and more interesting jobs if you use your intellectual resources."

There are those in the universities who scorn such practical research, Scott has found, but he is convinced that the new direction for universities is towards the community. It applies to any discipline, he says. "If I were chairman of a philosophy department I'd bloody well be thinking about, for example, how we could teach ethics to the business community and have them *want* to take it." He says he feels the urge to shout at those who disagree: "Please don't tell me not to contribute in the way that is important to me. Get out of my way!"

Scott is in a hurry. At 46, he has just been appointed head of an institute that has yet to be created, the Institute for Hydrogen and Electrochemical Systems in Ontario, funded by the provincial Ministry of Energy and sponsored by the U of T, and already he is champing at the bit, sure that there is not enough time left in his working years to do all the things that he wants to get done. Now that we have dug up most of the earth's fossil fuels and polluted the environment we have only about 100 years to find another way to survive, he thinks.

"I love science and very much enjoy it, but I'm probably too much of a dreamer," says Scott, who enjoys the abstract precision of music and ballet. There are symmetries in nature and in life as well as in art, he points out. The sort of crisis we're in was encountered on the earth once before, but in reverse. Four billion years ago all life on earth existed in an atmosphere of hydrogen. Gradually the hydrogen was used up, and the primeval bugs learned, over a billion or so years, to make it out of water using energy from the sun.

We don't have a billion years, but we do have a population of highly developed intellects and an abundance of power sources. Hydrogen can be made by a process called electrolysis, which breaks down water, H_2O , into hydrogen and oxygen. The process requires hydraulic or nuclear power, both of which Ontario possesses (in the form of hydroelectric and nuclear plants). And by a stroke of luck the headquarters of the Electrolyser Corporation, one of the world's largest manufacturers of the equipment needed for the process, are located in Toronto. The company has already constructed more than 400 plants in 85 countries and is ready with a plan to twin hydrogen production with the CANDU nuclear system.

At the institute, which comes into existence April 30, scientists and engineers from all over the world will combine their expertise to help Ontario develop systems to produce hydrogen. Since by Scott's calculations in 70 years the only oil left in the world will be used for petrochemicals like plastics, clothing and medicines, the world may well turn to hydrogen for fuel. By 1990 many of the developed countries will be using electricity and hydrogen instead of oil and by

2015 the practice will have spread to all of them, says Scott. Again, it's a pattern: as rural society changes to urban, fuels get lighter. In an urban setting heavy and bulky fuels can't conveniently be dropped off by truck, so we've switched to lighter fuels with less and less carbon and more and more hydrogen that can be distributed on a grid basis — by wire or pipeline. "If you just follow the trend, the end state is pure hydrogen," says Scott.

If he's right, there will be a mad scramble within his lifetime if not his working years for the fuel itself and the process to produce it. There will be a revolution in the marketplace that began in the laboratory. He wants to be in that lab, stirring and directing. And he wants Canada to be doing the same in the world marketplace. "It will take political courage," he says, "but Canada has a better opportunity than any other nation to be among the first."

We may be short on political courage, but we have lots of water and power. Hydro and nuclear plants could, at least at the beginning, be used to produce hydrogen when they would otherwise be idle. Once produced, the hydrogen could be stored in pipes until it was needed. A hydrogen pipeline, cheaper to build than electric transmission lines, would make it possible to use remote power sites.

Though the present experimental cost of producing hydrogen using Canadian power rates is about one and a half times the cost of oil, it's a foregone conclusion that as oil prices rise and innovations in electrolysis reduce costs hydrogen's price will be very competitive. Besides, very soon there won't be a choice. And when oil goes, if hydrogen is available, lighter, more powerful and far cleaner, can there be a question? The only by-product of hydrogen combustion is warm, fresh, clean water, which can be retained to recapture heat. No grease, smog, acid rain, black smoke or foul odours. And no fear of running out: unlike fossil fuels, hydrogen is an inexhaustible energy form.

The most obvious application in the present for this fuel of the future is in internal combustion engines. It's an ideal

fuel for all manner of vehicles from cars to rockets and space-ships. Eventually it could fuel factories, lowering both the cost of production and pollution of the environment. And it could be made practical for supplying residential heat and light and fuelling appliances.

Is all this pie in a clear sky? In its first year Scott's institute will probably spend \$1 million on developing a fuel cell van that will run on hydrogen, \$600,000 on electrochemical technologies for the building of the fuel cell and \$150,000 on information services to educate industry and the general public on the potential of hydrogen. By the time the institute's five-year contract with the University runs out the Ministry of Energy expects funding to be at an annual level of \$10 million, with the provincial government, the federal government and the private sector heavily committed. Lockheed wants to burn liquid hydrogen in its freight planes, Bell Canada wants its internal combustion engines to run on hydrogen, the Urban Development Corporation of Ontario has commissioned research on a hydrogen storage and fuel system for buses and the federal ministries of defence and transportation have asked Scott to work on fuel-cell technology for their vehicles.

None of the money for this research and development — not even rent — will come out of the University's threadbare pocket. The University is needed for its reputation and the wide-ranging expertise of its faculty, who would contribute on a contract basis. It is also needed for its links, however tenuous, with the community. There will be no formal classes at the institute. However, Scott would like to see it run short courses for business, industry and the general public. If research is going to benefit them, he wants them told about it, preferably by the University.

Says Scott: "The University has no downside risk, only an upside gain." ■

PROF. DAVID SCOTT WILL OVERSEE MULTI-MILLION DOLLAR HYDROGEN RESEARCH



ROBERT LANSDALE

YUKON MAN

BY NAOMI MALLOVY

ANTHROPOLOGIST WILLIAM IRVING THINKS
MAN MAY HAVE SURVIVED 150,000 YEARS AGO
IN THE FROZEN NORTH



Against the driving snow, in -50°C weather, six small men are hauling back part of the catch from their hunt, a successful hunt in which they were able to surround and kill a giant mammoth, ancestor of the elephant. Their apelike faces with sloping foreheads peer out of the animal-skin clothing which protects them from the cold. The snowswept taiga around them is barren except for some scruffy stands of spruce. Eventually they reach the women and children, clustered round a campfire by a frozen stream, and sheltered from the wind by a 50-foot pingo, a mound of ice formed by pressurized groundwater. Before they hungrily devour the meat, they must scrape it from the remains of the carcass, using bone tools they've broken and shaped from the animal itself.

The scene is 150,000 years ago, along the Old Crow River in the northern Yukon, 160 km. north of the Arctic Circle. The men and women are one of the earliest forms of man, *Homo Erectus*, or Peking Man. From the late Pleistocene age (a period covering the past two or three million years) they pre-date Neanderthal man (80,000 to 30,000 years ago) and

his present day successor *Homo Sapiens*. At this stage they're hardly thought to have the skills to survive in such adverse conditions in the frozen Canadian north. Until recently, no scientist had thought that men and women had arrived in North America before 12,000 years ago, nor believed they could have existed in the frozen wastes there at that time. What changed their thinking? What findings turned the anthropological world upside down, sent it reeling with scepticism and amazement, reset the very timeclock of early man?

It was four bones, four small bones, ranging from barely two to eight cm., discovered by U of T anthropologist William Irving and his party in the Old Crow Basin of the northern Yukon Territory. They aren't even bones of man; they're bits of animal bones and mammal tusk, but the crucial evidence they present, in Irving's judgement, is that humans have worked on them, chipped, scraped and polished them for use as tools. These, as well as 17 animal bones which presumably could only have been broken by people hitting them with a stone, and in context with some

HIS REASONING IS BASED ON WHAT HE CALLS "IMPOSSIBILISM"

223 other vertebrate fossils of the same period, supplemented by geological, botanical and glacial evidence, point to the conclusion that early human beings inhabited the area some 150,000 years ago.

Among his bones and his books in the weathered old Borden Building, itself an historic site, Irving ponders his finds. A middle-aged man with steel grey hair and steel rimmed spectacles, he speaks slowly, carefully, weighing each word like a valuable artefact.

"They must have been of a very high order of intelligence to survive in that cold environment," he says, his voice warming with admiration. "They had a very simple material culture but they had a tremendously sophisticated software culture going on in their heads. They'd reached a high level of capability long before man had reached that level in the Upper Paleolithic culture of Europe 35,000 years ago. When you consider that they needed regular meals, warmth and shelter, and had to care for little kids . . ."

As he talks you can almost see old Homo Erectus hunting the giant mammoth, or the ancient beaver, nine feet long and big as a black bear, or the pika, a creature like a baby rabbit. He'd have used the bone tools, straight from the carcass of slain animals, to prepare meat and to make fur clothing, even to trousers and boots. You imagine him building some shelter of skins or snow — there are no caves in the area. As you sit in slacks and sweaters in a warm building, close to stove, telephone and television, you think of him there, way north of the Arctic Circle, fifteen hundred centuries ago.

"These findings upset all our established chronology of when man first discovered fire, made tools and clothing and learned to adapt to a cold climate," he marvels. "And we've defined some hundred thousand years of total ignorance about the people who then inhabited the western hemisphere."

Although Irving had, in 1976, discovered a human jaw and tooth deduced to be that of an 11-year-old girl living about 10,000 years ago in the Yukon, this was the first evidence of humans of a much earlier period, evidence that is still being considered and disputed by anthropologists around the world.

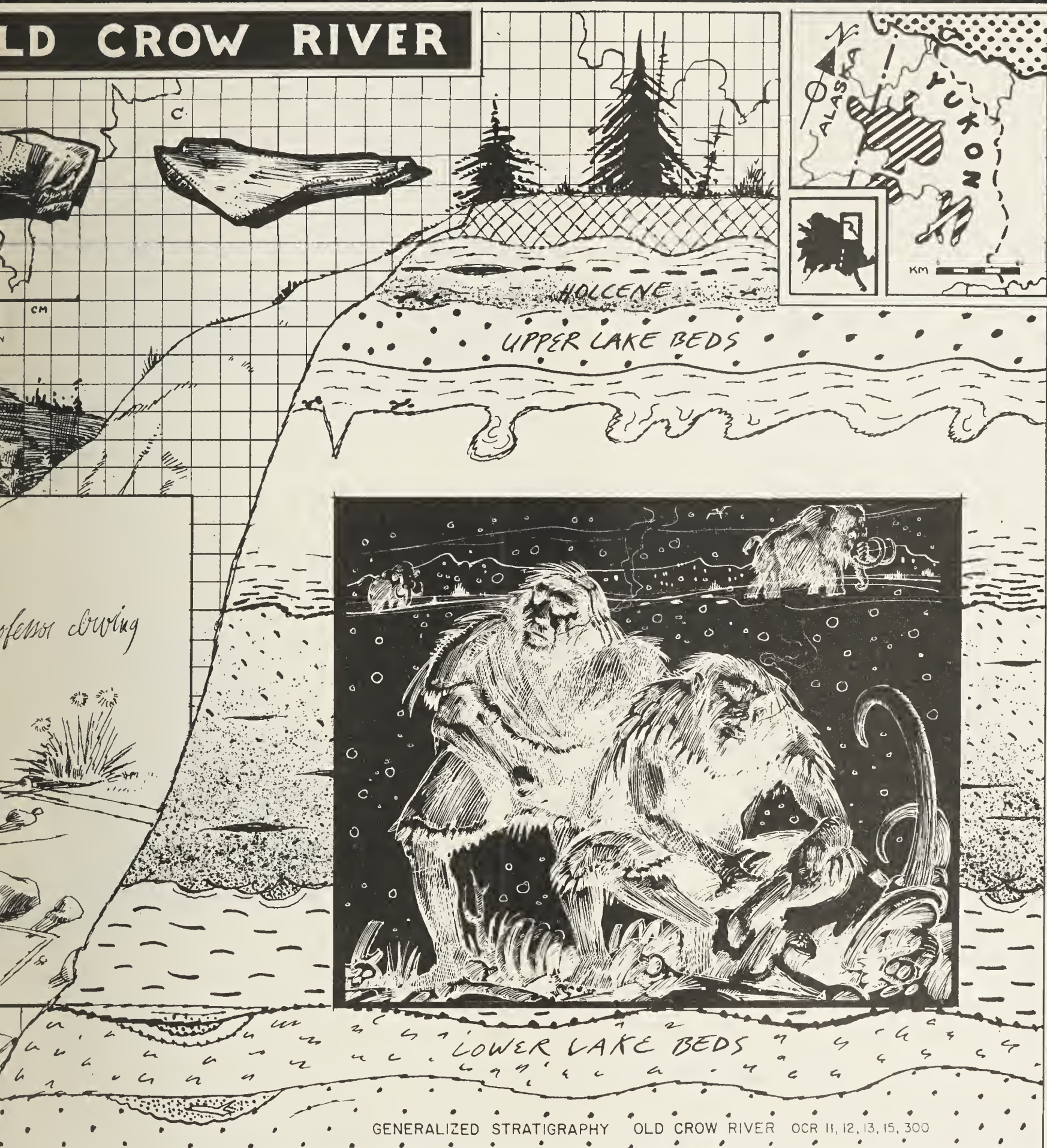
It was during a dig in the summer of 1979 that Irving found the first of his artefacts. With his associates, Allan Jopling, a geologist, and palaeontologist Brenda Beebe and other helpers, he was excavating a bluff overlooking the Old Crow River. Crew, tents and supplies had been lifted by helicopter into Old Crow Village, then brought by river-boat 50 miles to the camp. They'd been spending the long Arctic summer days patiently digging with trowels and shovels through the frozen ground, excavating, layer by layer, the sediment, blue-grey clay, gravel and coarse sand, down to what had been the land surface before it was covered by a glacial lake eons ago. Jopling, under a dangerous overhang on a 100-foot cliff, had a trailing rope attached to him in case it should collapse (an archaeological hazard). Beebe, her red hair concealed by a warm parka to protect her from the chill, damp air, was sifting soil and bone remnants in a pail by the river. Irving was probing cautiously with a trowel. Suddenly he called them, his voice pitched high with



excitement. He had found the first and biggest bone remnant which he could immediately recognize as being worked by man. It was, he told them, obviously a tool chipped from a larger bone, sharpened with a bone or stone, and used to scrape meat from animal carcasses.

The second discovery came the following summer after months of close examination of the bones in the lab. On the long table were arranged boxes of bones brown with age of everything from mammoths to insects, as well as brown bags full of sediment and plant remains. Brenda Beebe was

OLD CROW RIVER



studying her lemming specimens, face bent over the microscope, viewing the bones of this mouse-like creature. Irving was sorting fractured bones nearby. Suddenly she faced him and announced solemnly that the lemmings were of a species which existed *only* at that period and had since become extinct. "Be damned sure you're right!" exclaimed Irving, realizing that her observation placed the lemmings and therefore Yukon Man at the end of the Illinoian or middle period of glaciation during the Ice Ages, even before the Sangamonion (145,000 years ago) or the Wisconsin

period (70,000 years ago).

"I couldn't put those little lemmings out of my head," he mused afterwards. "It was the clincher, the time it all came together."

Lacking further concrete evidence such as a human skull, Irving has reached his conclusions through a series of deductions, much like piecing together bits of evidence in a detective story. If the land stratification and the vertebrate material indicate a certain period, and if the artefacts are found in significant relationship to them, then . . . And

"IT TAKES A MAN OF VISION TO TACKLE THE PROBLEM. OTHERS CAN FOLLOW"

conversely, in a line of thinking which he calls "impossibilism", (elaborated in his article in the journal *Arctic*, March 1981) he reasons that it would have been impossible for man to have survived then and there without a certain culture. In what he calls a new approach to the problem of when human beings first occupied the western hemisphere, he rates clues as to their existence more important than the traditional artefacts. In Irving's view, archaeology has its foundations in science but it requires imagination to interpret its findings. His critics say, with affection or with a keen sense of competition, that he does not lack the imagination.

Exact dating is difficult for such a remote period. Carbon dating is not reliable beyond 40,000 years ago, and some of the precious bone must be sacrificed to the process. A new mass spectrometer machine soon to be installed at the university will extend the dating back to 80,000 years; it will be helpful but not definitive in this case. Pending confirmation by other means, Irving is relying on circumstantial evidence and the accumulated knowledge and insight he has gained from 15 years of study by himself and others in the area.

His has not been the only group excavating along the Old Crow River, said to be one of the most fertile in the world for fossil material. Scientists with the Bering Yukon Refugium Project of the Archaeological and Geological Surveys of Canada have also been working there, at first co-operatively with the Irving group, but lately more independently, due to rivalry and differences of opinion between the two groups. Some of the scientists have moved from one group to the other, and there are even claims that fossils belonging to the rival group have been illegally retained by both sides. In the race to document the greatest age, and to publish findings in learned journals, such fossils play an important role and feelings about them run high.

Findings of the government group so far place the earliest date of Yukon Man at around 70-80,000 years ago. Richard Morlan of the National Museum of Man in Ottawa and archaeologist with the project, has collected artefacts from what he considers the same geological level as the Irving party. In the windswept, factory-sized building housing his office some 20 miles outside Ottawa he opens drawers from rows and rows of locked cabinets to show fossils, some labelled with blue stickers for those marked somehow by natural causes, some marked with red stickers for those presumably worked by man. The red-labelled ones are polished, serrated or dented as if by man; the blue-labelled pieces have etched lines probably from animal tissue, roots, or the movement of river ice.

Morlan disputes Irving's interpretations on several grounds. The polish on the bones thought to be made by humans could have been caused by freezing and thawing in the river, causing them to move in the ground. Also he's not convinced there ever was a lake of the Illinoian period where Irving found them. Rather, he thinks, they were on the channel bottom of a river active 80,000 years ago, at the time his own artefacts were found downstream. Also, the tooth form of the lemmings, said to be of an extinct variety, has been found in some modern lemmings on Banks Island in

the Beaufort Sea. A further 100 lemming remains of the period would be needed for good statistical expression, he maintains. Finally he challenges the theory of the broken bones. But so far, though fresh bones of modern elephants, similar to those of the ancient mammals, have been subjected to trampling by elephants (who even threw the bones at each other and onto the concrete floor), they haven't yet broken. Morlan would still like to test whether elephant bones would fail to be cracked by ice in a spring breakup.

Dr. Richard Harington, a palaeontologist with the National Museum of Science in Ottawa who was first to discover in the Old Crow Valley a bone tool of early man's, since carbon dated to 27,000 years ago, shows great interest in Irving's finds. A huge man, a former wildlife biologist who inhabits an office building housing dinosaur and other bones on the outskirts of Ottawa, he puts great emphasis on the evidence of ancient fauna in the area but agrees that a larger sample of the early lemming variety, known as *dicrostonyx*, should be sought.

Other North American anthropologists greet Irving's conclusions with varying degrees of scepticism and approval.

"I'm highly sceptical of them," says Dennis Stanford of the Smithsonian Institution bluntly. "He's a long way to go before he can substantiate that age. He's out there on a limb, but at least he has the courage of his convictions!"

Says Scott McNeish, director of the Peabody Foundation at the Phillips Andover School in Massachusetts: "He's found some of the oldest remains in Canada. I hope he gets more in good condition. His discoveries are being received with a great deal of caution and resistance in what is certainly a very conservative profession."

And says Robson Bonnicksen of the University of Maine: "It doesn't surprise me that the bones are that old. His findings will influence the course of discovery of the early inhabitants of the United States. It takes a man of vision like Irving to have the foresight to tackle the problem; others can follow and put the parts of the puzzle together."

Irving himself is philosophical. "It takes a long time to generate any revolutionary theory, particularly in this field which has been plagued by so many hoaxes and extravagant claims in the early part of the century," he says. "Archaeologists have been debunked with such vigour that they've discouraged others from even looking."

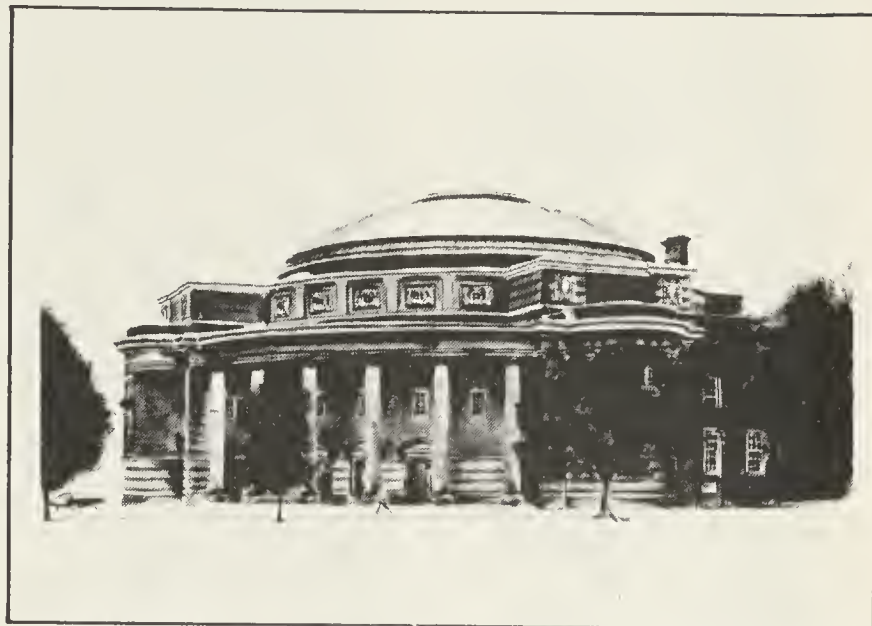
Professor Maxine Kleindienst, chairman of the U of T's anthropology department, puts it into perspective. Terming Irving's discoveries "an exciting intellectual breakthrough," she says his contributions and those of the National Museum of Man group are causing researchers to rethink the time-span between 80,000 and 150,000 years ago. Obviously there's rivalry and argument between the two groups; that's par for the course in most sciences.

The situation is similar to that between famed anthropologists Leakey and Johansen. Richard Leakey in 1972 discovered a human skull dating back two or three million years and in 1975 a 1.5 million-year-old skull of *Homo Erectus*, both in Kenya. That same year his arch rival, Donald Johansen, in neighbouring Ethiopia came upon the skeleton of "Lucy", a three-million-year-old *Australopithecus*, a genus of near man. Debate about their respective finds still rages. ■

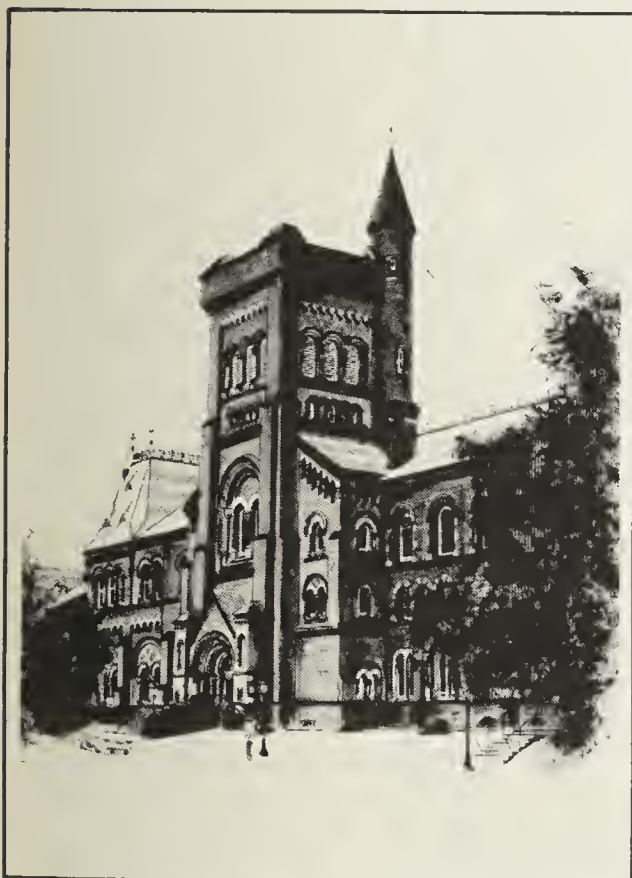
Naomi Mallovy is a freelance science writer.



Hart House



Convocation Hall



University College

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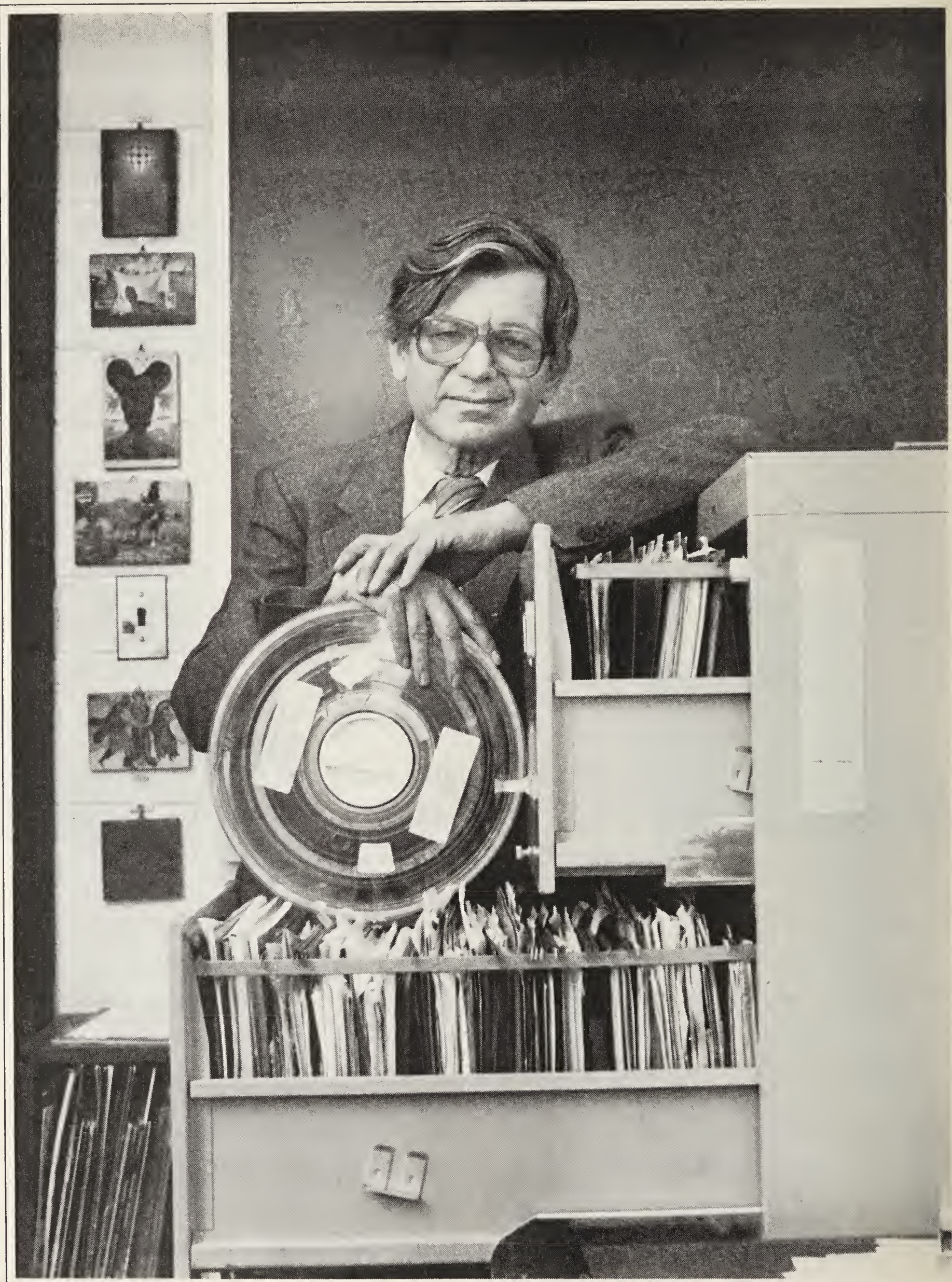
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MISTER COMPUTER

BY PAMELA CORNELL

"I SEEM TO BE PERPETUALLY TIME-SHARED,
OVERLAPPED, MULTIPLEXED AND PERPLEXED,"
SAYS KELLY GOTLIEB. WHICH IS HOW HE LIKES IT.

The computer science students were hostile. At the front of the classroom stood Jean Claude Parrot of the Canadian Union of Postal Workers. For three months, a series of rotating postal strikes across the country had thrown the mails into chaos. A key issue had been the threat of computerization to job security. The students clearly identified with management in the dispute.

Parrot had been invited to this "Computers and Society" class because Professor Calvin C. Gotlieb wanted his students to hear, first-hand, the postal workers' point of view.

Though the questions were aggressive at first, the union leader responded calmly and by the end of the class, the hostility had been neutralized. Some students were even sympathetic. Parrot later wrote to Gotlieb to thank him for providing an atmosphere in which inflammatory issues could be discussed rationally.

"We who work with hardware and software can't expect to see our products regarded as unmitigated blessings by the rest of society," says the professor whose compulsion to keep identifying problems and seeking answers has kept him at the vanguard of computer science for 34 years.

In 1948 — at 27 and with a Ph.D. in physics — Kelly Gotlieb was hired by three U of T professors to help explore the possibilities of building Canada's first electronic computer. From then on, his career has been a series of firsts.

He was a founder of the University's computation centre in the early '50s. He started the nation's first university credit course in computing. He did groundbreaking work in business applications of computers and in their use for constructing school timetables. He supervised the first Ph.D. in computer science to be awarded at a Canadian university.

Then, as others surged into the field to tackle its technological challenges, Gotlieb stepped back to contemplate the broader picture. Over the past decade, his pioneering work on the socio-economic implications of computers has made him an influential adviser to the United Nations as well as to the Canadian and American governments.

A man of ideas, Gotlieb does not particularly enjoy doing day to day supervision. Once a project has been launched, he's anxious to focus on another of the innumerable schemes that make up his awesome juggling act. His chronic dynamism exasperates colleagues of a more meticulous nature and he once had his knuckles rapped for not being

sufficiently dogged about administrative duties.

"I seem to be perpetually time-shared, overlapped, multiplexed and perplexed," he says, drawing on the jargon of his discipline.

While he occasionally feels driven, he considers it "only proper" to make good use of his mind. He teaches, he writes, he serves on committees and boards, he runs a one-man consulting company. He co-directs a Canada/Brazil computer education program, sponsored by the Canadian International Development Agency (CIDA). Most recently, he's been named director of a co-operative on information technology between the Universities of Waterloo and Toronto. (Its purpose is to co-ordinate multidisciplinary research projects combining expertise from such areas as law, electrical engineering, economics, library science, and computer science.)

In everything he undertakes, Gotlieb makes a substantial emotional investment. He's guided by his intellect but his enthusiasm provides the impetus that propels him through his overloaded agenda.

The combination of caring so much and taking on too much has made him vulnerable. Fifteen years ago, when he was both chairman of the computer science department and director of what is now the University's computer service, he was denounced by critics who claimed he wasn't doing either job properly. Friends say he was deeply hurt by the charge.

"Kelly had a vision," says fellow computer scientist Pat Hume, now master of Massey College. "He drummed up huge amounts of grant money to buy hardware then, by making the service accessible, he set about getting as many people as possible hooked on using computers.

"Suddenly from the novelty — indeed the miracle — it had been at the beginning, computing was being demanded as a right. Where Kelly had been an innovator, he was now a servant. Then, when a user sequencing system didn't work properly, a lot of people became militant.

"Maybe he should have been putting more pressure on IBM to get the bugs out of the transmission line. I don't know. But I do know that generating our special-purpose software was virgin territory and, all too often, the technology wasn't up to the ideas people had for it."

Since resigning as departmental chairman in 1967 and as director of the computer service in 1970, Gotlieb has avoided administrative posts where, he says, "the urgent invariably pre-empts the important" (an observation the University's president has appropriated).

Gotlieb is still as busy as ever but he's more cautious about what he takes on — refusing requests that don't allow sufficient lead time.

"The hard thing is not to *do*," he says, "but to figure out *what* to do. I try to pay attention to what's going to be important six months from now. Once I've identified the key issues, I let them percolate on the back burner. I'm always pressured, but not by things I have to do tomorrow."

As inspiration strikes, Gotlieb tests it out on people. Ideas with potential are refined; the rest are rejected. The longer the lead time, the surer the touch.

"Kelly devotes his energies to what's productive," says Katherine Packer, dean of the Faculty of Library Science and a fellow organizer of the co-operative on information technology. "He's good at cutting his losses. Some people move on without ever admitting there *were* any losses. Not Kelly. By assessing things honestly, he continues to grow."

Not that Gotlieb's judgement always depends on a six-month gestation period. When he decided to propose to Phyllis Bloom, he'd only known her two months. (She took two years to consent.)

"I was attracted by the way he accepted me," says Phyllis Gotlieb, who made her name as a poet then switched, at 50, to writing science fiction. "He didn't seem to notice what other people regarded as eccentricities."

After 32 years of marriage and three children, the Gotliebs are each other's most trusted advisers. He offers suggestions for researching technological aspects of her novels; she has been known to smooth out the prose in his textbooks and reports. Together they discuss how best to handle the characters — hers fictional, his real-life — with whom they must work.

Phyllis wasn't the only one to redirect her work at 50. Kelly, too, stopped to catch his breath and evaluate his pursuits.

Always healthy and vigorous, he resolved to stay that way by taking up sports. With the same fervour he brings to his work, he now swims, sails, and skis cross-country. Even breaking his shoulder in five places as a result of a skiing accident hasn't quelled his enthusiasm. (He just had his doctor strap him up, flew to the Maritimes to give five lectures in four days, then made a point of avoiding the red trails.)

But the biggest shift came when he was asked to join a United Nations panel compiling a report on how computers could help developing countries.

"The UN assignment aroused my interest in the relationship between computer science and society. Our report came out in 1971 and I'm told it's been an all-time best seller as UN publications go."

His concern about the far-reaching effects of an increasingly computerized world grew when he participated in a task force on privacy for the federal departments of justice and communications. Far from seeing computers as an insidious threat to privacy, he thinks they've contributed to a heightened awareness of citizens' rights.

"In most countries there was little protection of individual privacy even before the era of computers. By making us aware of the importance of privacy, their development has led to protective legislation in many places. Also, the recognition that individuals should have access to their own personal records is resulting in a gradual strengthening of freedom of information laws."

Gotlieb is less optimistic about the impact of

microprocessors on employment. The overall trend is unmistakable, he says: while output increases, the number of jobs decreases. New jobs created by the computer industry itself don't begin to make up for those lost.

He sympathizes with the stand taken by the Trades Union Congress in Great Britain. It has adopted two principal points for future action.

"The first is that no new technology that has major effects on the work force should be introduced unilaterally. Full agreement on the range of negotiating issues must be a pre-condition to the change, along with full job security for the existing work force.

"The second point is recognition of the need to search for opportunities of linking technological change to a reduction in the working week, working year, working lifetime. Simply put, this means job-sharing."

A harbinger of the long-term social impact of microprocessors can be seen in the Gotliebs' sitting room. At first glance, it looks like an ordinary television set. The difference is that it's hooked into Bell's telecommunications network.

A simple hand-held keypad provides access to an enormous body of information including the week's specials at the supermarkets, listings of sports and arts events in Toronto and New York, airline schedules, stock market quotations, news, weather, and games.

It's a developmental version of a Telidon home videotext system — one of about a thousand loaned out across Canada on a one-year trial. Suggestions from the hand-picked testers should help streamline this interactive system's ability to deliver — at an affordable price — such services as browsing, buying, direct payment from one bank account to another, and transmission of "letters" (electronic mail) between system users.

"Soon it will be cheaper to send a short message by electronic mail than by ordinary post. And since well over half our first class mail relates to payment transfers, an obvious consequence of the videotext system will be reduced employment in the postal service. In fact, there will probably never be an economic return on all the equipment installed to handle postal codes."

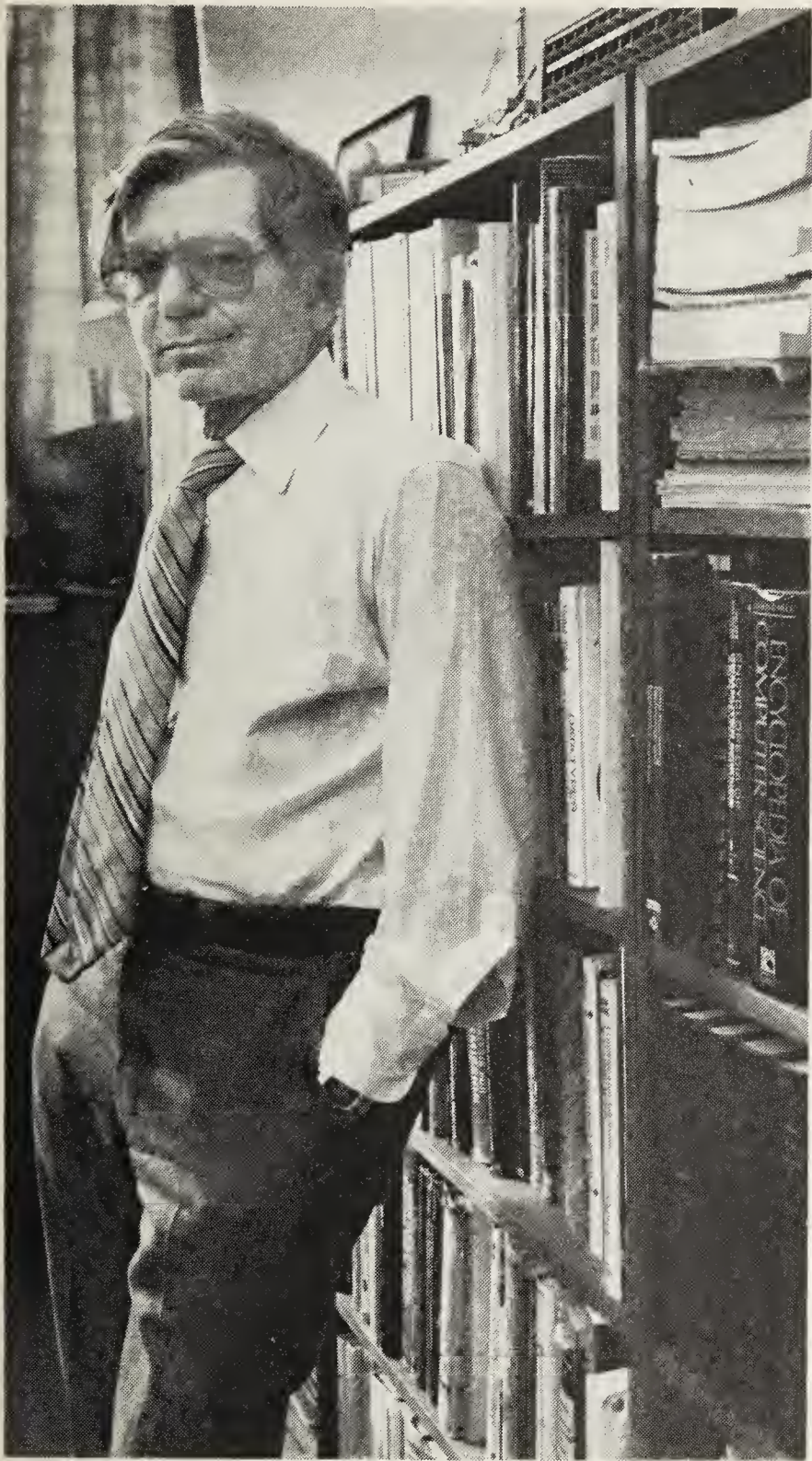
The courses Gotlieb teaches are "originals", which means he's had to come up with original textbooks. The one for computers and society he wrote with the present chairman of the department, Allan Borodin. With Pat Hume, he wrote a text on high speed data processing and he collaborated with his son, Leo Gotlieb, on a book about data types and structures. The work in progress — a solo effort — is on the economics of computers.

"Once I have a textbook, I don't feel the slightest obligation to dictate notes. I'm afraid that's contributed to unfavourable teaching assessments from undergraduate classes of more than 60.

"Their goals are very short-term. They're out for marks and they want a good set of notes — neatly organized into a package. But they're not going to find things compartmentalized out there.

"My advice is to write nothing and just listen. If, in 10 years, they can remember three things I taught them, my goal will have been achieved.

"Still," he admits, "I look at those classes and brood about them and get quite unhappy."



**"KELLY COMBINES A TECHNICAL
RESEARCH BASE WITH
AN UNDERSTANDING OF THE
POLITICAL STRUCTURE"**

In contrast he derives enormous satisfaction from seeing his concerns about the social impact of computers being shared by an ever increasing number of his colleagues.

"Computer science is full of technologists who view the social stuff as 'soft'. To have it taken seriously, I had to make sure my credibility was solid. So I've had a deliberate policy of continuing to do the technical stuff. I do about half and half and enjoy both."

Since Gotlieb and Borodin wrote their textbook on social issues in computing, more and more universities have been able to offer courses in the subject.

Within the International Federation of Information Programmers (IFIP), Gotlieb has succeeded in establishing a special technical committee (TC9) on the relationship of computers to society. The Soviet bloc countries — who've always supported IFIP because it gives them access to

Western technology — were uniformly opposed to the creation of TC9.

"They wanted to stay away from social issues. They didn't care to discuss those aspects of computers that might be deleterious to the working class. But since the committee was formed in 1975, they've gradually been coming round. Now the East Germans are participating and they're the hardest of the hard."

Even industry is finding it's in its own best interests to become more sympathetic to the broader implications of computing and has been seeking relevant advice. Whenever Gotlieb makes a presentation — whether as a consultant to industry or in an invited paper at an IFIP congress — he's careful to do his homework and set forth measured views. To do otherwise would be to risk being labelled an extremist.

Credibility is vital to the role he cherishes. Empire building he leaves to others. He prefers to be quietly influential behind the scenes, getting his views across while a policy is still in the formative stages.

"Not many of us inside the university know what's going on outside," says Borodin. "Kelly combines a technical research base with an understanding of the political structure. He has a staggering number of contacts among decision makers at every level."

"In a way, he's idealistic — wanting the discipline to be well-run within the university and helpful to society at large. But he's also pragmatic — willing to recognize the need for politically acceptable solutions."

When still a student at U of T, Kelly Gotlieb decided his scientist's focus was too narrow. So he went through the arts and science calendar and devised a humanities reading list for himself. At 60, he continues to read as widely as possible. He remembers being particularly strongly influenced by Aldous Huxley's essay *Ways and Means*.

"It advocated being rational, sensible and decent. Since reading it, I've consciously tried to operate that way."

Gotlieb is the kind of man people of all ages go to for advice — both personal and professional. Colleagues describe him as compassionate, incapable of pettiness, open about what's on his mind, discreet with the confidences of others.

His daughter, Jane, a Ph.D. student in chemistry, regularly refers her friends to him when they need advice.

"I respect his judgement and I never need to worry about confidentiality. There's so much going on in his mind that other people's secrets are quickly crowded out."

Gotlieb is prone to bouts of frantic mental activity — four a.m. being a particularly productive point in his day. No matter how late he's been up working the night before, his mind is nudged into consciousness by a tumble of ideas. Minutes later, he's out of bed and downstairs scribbling hurriedly before the ideas evaporate, unrecorded.

His high-pressure lifestyle gave him chest pains for many years. At first he thought it might be a heart problem but his doctor said no, it was just tension.

"He told me to cultivate serenity; instead I just keep re-ordering my priorities. I've never been so excited, had so many ideas."

"I have this sense that computers are the key to organizing and extending all knowledge. That might sound like a colossal piece of arrogance but as long as that notion is hanging there — tantalizing and just out of reach — I think I'm going to have trouble suppressing this manic thing." ■



EQUINOX/BY IAN MONTAGNES

WHERE TO LOOK FOR SIGNS OF SPRING

There's a strip of garden, just off St. George Street, which some of us watch avidly as the equinox approaches. Here, sheltered from the north by an old brick wall that harbours the March sun, appear the first proofs of spring — snowdrops, then crocuses and hyacinths — while most of the rest of the campus is gripped by winter.

There are a few other such spots. Daffodils glow early at the base of Soldiers' Tower and beside the nursing building. A little later, scilla spread blue along the fringe of Queen's Park Crescent in front of the Faculty of Law.

The spring flowers are more than a reaffirmation of returning warmth or an encouragement for the undergraduate as examinations near. They are a sign of good neighbourliness, a reminder that a university grappling with tight budgets still has place for beauty.

By May the formal beds are planted: on the front campus (backdrops for more snapshots of brand-new graduates), in front of Trinity, in the hidden quadrangle of Knox, around Victoria and St. Michael's, at Scarborough and Erindale, and in unexpected corners, brightening the tired faces of converted houses, relieving the angularity of modern concrete.

During the hard years of the 1930s, the university's flower beds were tended by the wives of faculty members, who brought seeds and slips from their own gardens. That may explain the hollyhocks which appear each year in front of University College — an unexpected, homely sight.

Today, care of the grounds is a year-round job. In summer, a handful of students are hired to help. In autumn, groundskeepers collect the fallen leaves. Some are carted off to blanket a rose garden south of the University College Union. The rest are composted for another year.

Even in mid-winter the work continues. Then nursery experts prune the trees. Such attention has preserved a number of the giant elms, glories of the older campus, from the incursions of Dutch elm disease.

The trees testify to the concern Varsity has always felt for its grounds. Some trees are older than any neighbouring buildings. Others were planted 60 or 70 years ago when the university must have been planning an arboretum. There are more than 70 species. Exotics — Russian olive, Siberian elm, Turkish hagel, Tree of Heaven — grow alongside native maple, birch, ash, beech and pine.

During the 1970s the university began a new program of tree planting. Today a Sesquicentennial parade of oaks marches up King's College Road and flowering crabs dot the circumference of the front campus.

There is a story that one tree, more than a century ago, dictated the appearance of the campus. When University College was still on the drawing board and all the area was parkland, the governor of Upper Canada wanted the college to front towards the east. The architect and the vice-chancellor of the university wanted it to face south. They won, of course. The governor surrendered aesthetics to sentiment, it is said,

because his plan would have required the destruction of a noble tree.

Just possibly this was the great elm, at the southwest corner of the college, which finally succumbed some 20 years ago. At least, several of us at the time enjoyed thinking so. I was there when the chain-saw cut through its five-foot bole: the ground shook at the fall. As a reporter for the old *Varsity Graduate* I also had the privilege of accompanying to the campus the elm's replacement — a 40-foot red oak wrested on a crisp January morning from a frozen pasture and trucked 15 miles in a giant cradle.

When it was dropped into position, a professor shook his head. That tree would never grow, he predicted. Its roots were too shallow.

Gloom-and-doom is never in short supply around a university campus. But, nurtured and loved, that oak has thrived, casting green shade in summer, blazing in autumn.

Could there be a connection with a university that has a tree in its motto, *Velut arbor aevo*, and boasts an oak as the crest in its arms? ■



UNSETTLING DEBATE

Unhappy with a decade of salary settlements that have failed — like Ontario's grants to universities — to keep pace with inflation, the Faculty Association (UTFA) last summer launched a campaign for binding arbitration.

Under the *Memorandum of Agreement* between the University and its faculty, failure to reach agreement resulted in the appointment of a mediator. If agreement still could not be reached, the mediator submitted to Governing Council a report on which that body then voted.

Only once in four years did the two sides agree on a settlement without recourse to mediation. On the other three occasions, the mediators' awards came closer to the administration's last offers than to the faculty's last demands. UTFA protested that it was being short-changed because the mediators were tailoring their reports to win Governing Council approval.

When UTFA's call for binding arbitration was rejected last fall by a Governing Council advisory committee, tensions mounted, with UTFA threatening to unionize.

Then President James Ham intervened by initiating confidential talks between two of the University's vice-presidents and two executive representatives from UTFA. For 10 days, the four were holed up in a hotel where their intensive negotiations eventually resulted in a mutually agreed process of binding arbitration under the aegis of the *Memorandum of Agreement*. The President duly recommended their proposal to Governing Council.

Opponents of binding arbitration argue that Governing Council — comprising elected representatives from faculty, students, administra-

tive staff, and alumni, as well as presidential and government appointees — should not give up its authority to an outsider.

Supporters of binding arbitration suggest that, had UTFA not been placated, the University "might have been split apart". Further, they point to settlements with hospital workers as an indicator of how binding arbitration has proven effective in pressuring government to increase funding.

Opponents, however, fear that Queen's Park would not bail out the University unconditionally but would impose stipulations, effectively ending the University's autonomy.

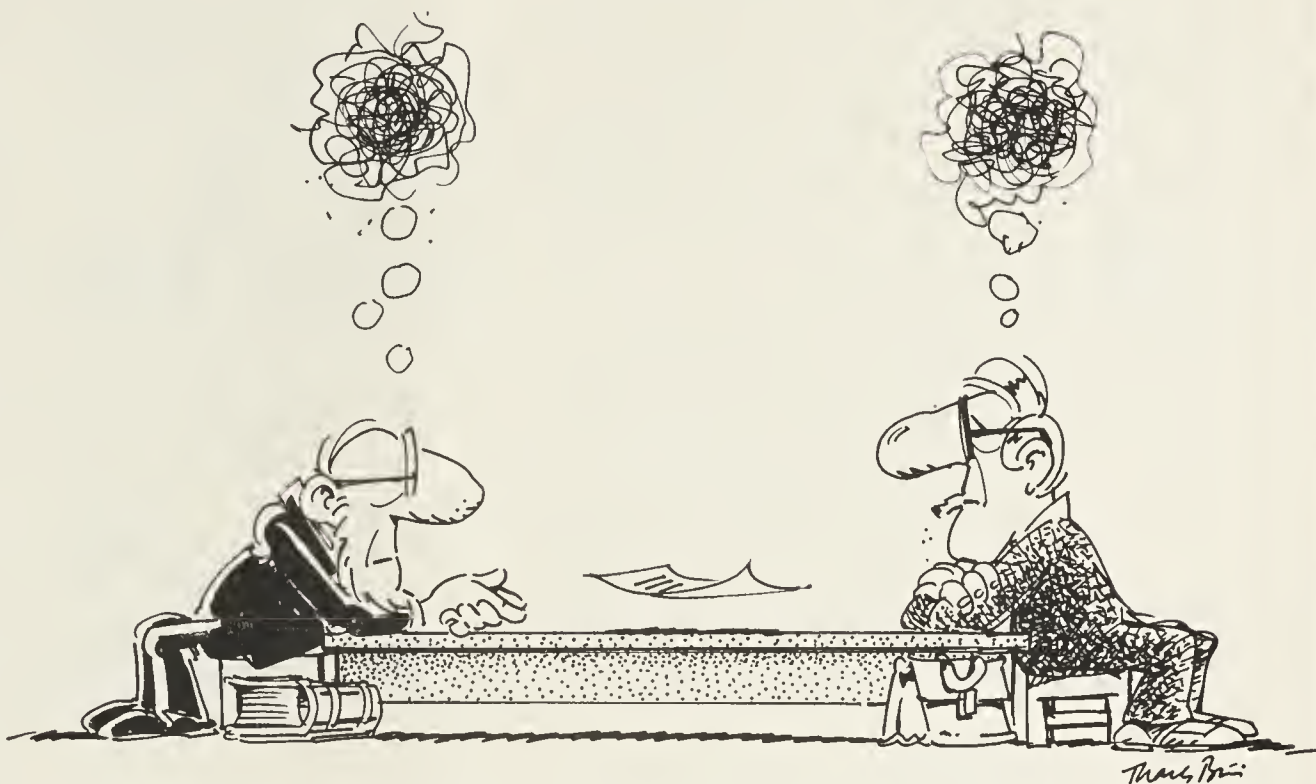
Students worry that higher salary settlements for faculty would mean higher tuition fees; and administrative staff — being untenured —

worry about layoffs.

When the issue came before Governing Council in January, there was standing room only in the vast chamber. Observers endured several hours of trenchant debate before the vote was finally called. The verdict: 23 to 20 in favour of binding arbitration.

But, as of early February, the wrangle continues. The University's lawyers say the *University of Toronto Act* does not give Governing Council the right to delegate its duties. UTFA's lawyers contend that hiring an arbitrator is not necessarily a delegation of authority and that the power to fix salaries is not necessarily a duty.

If the actual salary negotiations are as protracted as the preliminaries, professors will be waiting a long time for those increases.



ILLUSTRATIONS BY THACH BUI

PASSING GLORY

When U of T quarterback Dan Feraday, 25, was named this year's outstanding player by the Canadian Interuniversity Athletic Union, he was presented with the Hec Crighton trophy. The other part of his prize — \$1,000 from Schenley Canada — went not to Dan but to the University's bursary fund, which is available to any financially needy student, however unathletic.

The St. Michael's College history student has also added \$1,000 to the fund by being, for the second year in a row, among those players designated "all-Canadian" — an honour that brings \$500 from Nestlé Enterprises Ltd.

Passes are the key to Feraday's success. Not the hey-sailor type but the kind that have sent the ball a total of 2,656 yards down the field to break all Canadian university passing records and give the passer more than a passing chance at a professional football career.

The ever-reliable receiver of Feraday's passes is Mark Magee, a 23-year-old student in the School of Physical and Health Education. Besides breaking most Canadian university receiving records, he has augmented the bursary fund as an "all-Canadian" player for two consecutive years.

Together this stellar duo helped the Blues finish the regular season in second place. Unfortunately, neither will be bringing glory (or money) to U of T next fall because they both graduate in the spring.

FADING BEAUTY

Naked, she languished in the basement of the Galbraith Building for who knows how long. Then one day she was discovered and her worth recognized. She was valued at between \$30,000 and \$40,000.

The work of mid-nineteenth century French painter Fantin-Latour, this forsaken nude had been damaged by water in 1977 when fire gutted the adjacent Sandford Fleming Building.

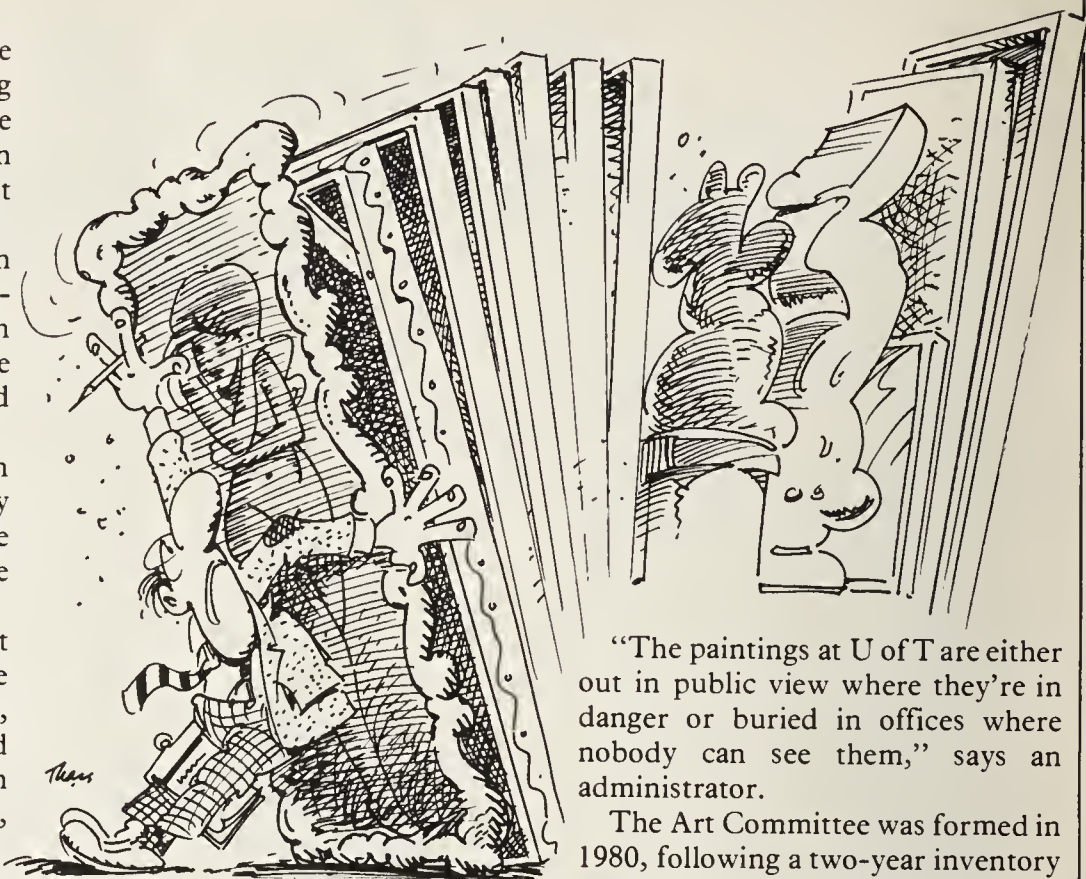
Now those ravages have been repaired, but alas, once again the lady has been banished — this time to the dark recesses of a vault, lest she be carried off by brigands.

What the lady needs, and might soon have, is a protector — someone who will display her to advantage, pay her insurance premiums, and purge her environment of such corrupting influences as heat, light, dryness, and moisture.

Of course, she couldn't expect to have a monopoly on all that attention. It will have to be shared with the rest of the University's \$10 million fine art collection.

In response to a report by the U of T Art Committee, Governing Council has approved a plan to hire a curator, provided a private donor or foundation can be found to pay the annual salary of about \$24,000.

There are approximately 3,000 pieces in the University's fine art holdings, including about 200 of museum quality. Hart House alone has a collection of Canadian art worth at least \$2 million and is building a gallery to house it. Unlike Erindale and Scarborough, the St. George campus lacks suitably secure and



"The paintings at U of T are either out in public view where they're in danger or buried in offices where nobody can see them," says an administrator.

The Art Committee was formed in 1980, following a two-year inventory that turned up all kinds of long-lost treasures. Besides the nude in the Galbraith basement, there was a painting at St. Michael's College by pioneer Canadian artist George Berthon. College administrators, delighted by the discovery, gave the painting a room of its own, named after the artist.

Even works out in plain view were found to be victims of indifference and neglect. On a dining room wall, for example, hung a valuable painting slowly being destroyed by heat and smoke from a toaster directly beneath it.

When will a curator be hired to guard against such atrocities? The goal is this summer, but it all hangs on finding a benefactor.

environmentally controlled exhibition space. This, says the Art Committee's report, makes U of T a glaring anomaly among other such institutions in North America.

Among the "homeless" are works by the Group of Seven and by such contemporary Canadian painters as William Kurelek, Jean-Paul Riopelle, and Harold Town. There are also original prints by Manet, Kollwitz, and Whistler, along with valuable tapestries and classic English portraits — one of them by Lely, of the young man who was to become King James II of England.

WHAT, AGAIN?

For the second time in six months, the Trudeau government has provoked indignant outcries from universities.

First, manpower and immigration minister Lloyd Axworthy imposed a strict "Canadians first" hiring policy on them.

Now, communications minister Francis Fox has indicated that scholars must be stimulated to do their research on fundamental issues in Canadian society. The idea is to convince the public that scholarly investigation is not just a self-indulgent pastime for a handful of insular intellectuals.

Despite protests from universities, the federal government has provided

an earmarked increase to the budget of the Social Sciences and Humanities Research Council (SSHRC). For the coming academic year, \$5 million has been allotted to fund research into: the aging of the Canadian population; the Canadian family and the socialization of children; and the human context of science and technology. For the following year, another \$5 million will be provided, with the list of "targeted" topics being expanded to include native studies and women in the work force.

The council — made up of prominent scholars — used to have complete autonomy in deciding which project proposals deserved funding. Though SSHRC has indicated that funding for research

outside the realm of Canadian studies will remain at its current level (with annual adjustments for inflation), scholars are sceptical. They fear a gradual redirecting of funds away from independent, curiosity-based research.

John Leyerle, dean of the School of Graduate Studies, calls the scheme "the harbinger of a new ignorance". Even scholars fortunate enough to be working in the "strategic" areas are outraged that politicians and bureaucrats are dictating how SSHRC should spend its money. Professor of Canadian history Robert Craig Brown calls the scheme "an unprecedented intrusion by a federal government agency into the academic policy-making process of the universities of Canada".

PROJECTING ENTHUSIASM

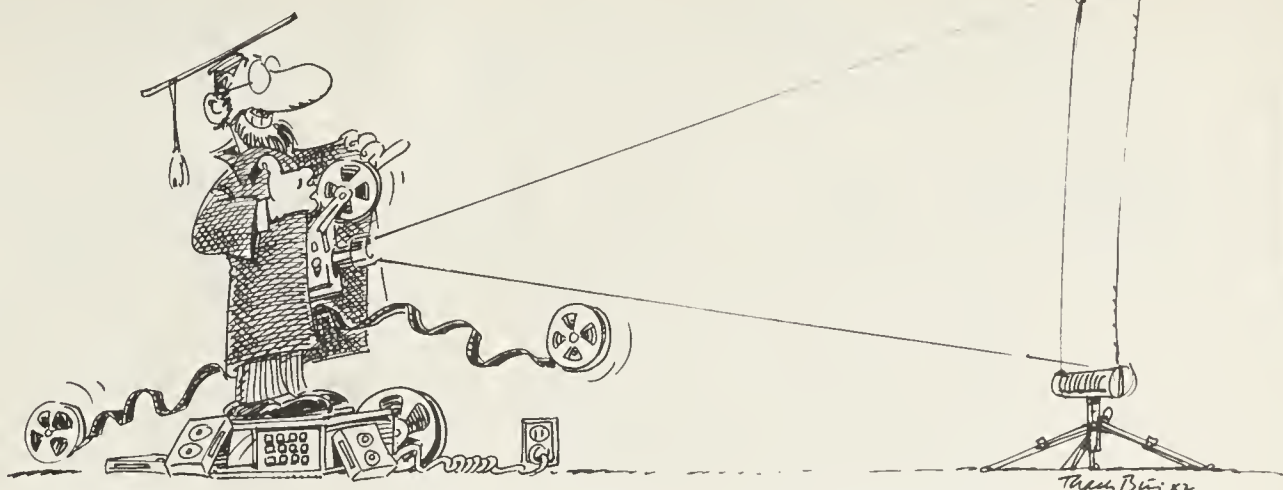
Just because classes are no longer held at eight a.m. or on Saturdays doesn't mean U of T professors are any less dedicated. From the cinema studies program at Innis College comes this tale of selflessness and co-operation.

Instead of pocketing their lecture fees, the 11 faculty members teaching a "Great Directors" course for the School of Continuing Studies (SCS) are donating the money to an acquisitions fund for new films and projection equipment.

Everyone just jumped right in when someone suggested donating the \$85 fee from each of the 15 lectures, says program chairman Gino Matteo.

"We're a have-not group but we're enthusiastic because we helped found a new discipline at the University and that's exciting."

Launched nine years ago, the cinema studies program at Innis now averages an enrolment of about 700 in the 12 to 16 courses offered within the Faculty of Arts and Science. This year's pilot course at SCS was expected to attract 25 or 30 students;



102 signed up. The program has been asked to offer two courses there next year.

A collection of films and videotapes worth between \$70,000 and \$100,000 and including more than 300 titles is housed in the Sigmund Samuel Library. Still the program's needs are ongoing.

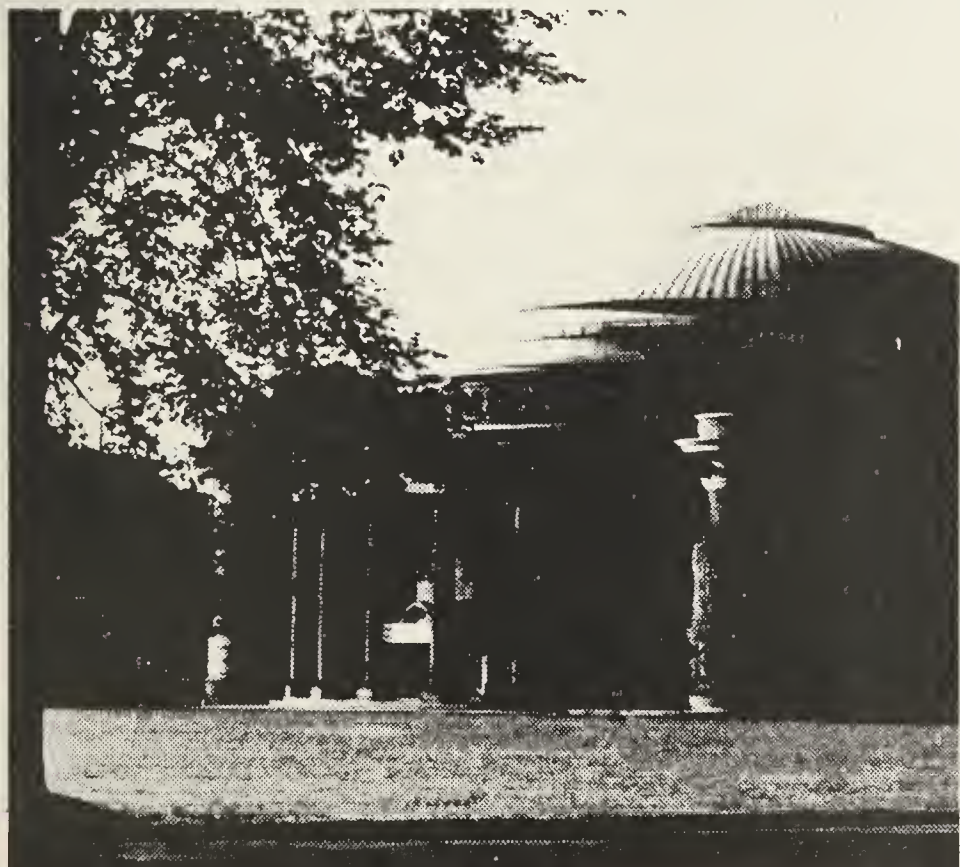
Approaches made to embassies have resulted in several Polish and French film-makers donating their work, says Matteo, so that avenue will continue to be explored. But because the library is not equipped to provide climatic control, program organizers would prefer to shift over

to videotape, which doesn't deteriorate as rapidly as film.

Though a videotape copy costs \$70 to \$100, compared to \$600 or \$700 to buy a film or \$100 to \$200 to rent one, a videobeam projector can cost as much as \$16,000.

With every intention of rechanneling their lecture fees again next year, cinema studies faculty members are putting together a different "Great Directors" course. The second SCS course has yet to be determined but themes requested so far have included love, war, peace and, from a man in this year's class, "beautiful pornography".

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For information on joining the Presidents' Committee, please telephone (416) 978-2171 or write to the chairman, C. Malim Harding, at the Department of Private Funding, Room 305, 455 Spadina Avenue, University of Toronto, Toronto M5S 1A1.

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Charles S. Pachter, Sybille

LETTERS

NON-CANADIANS ONLY 10.7% IN 1981

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Jennings D. Young.

Eugene Zdasiuk, Adam H. Zimmerman.

And those donors who prefer to remain anonymous.

Two letters to the editor in the Jan./Feb. issue applaud Minister of Employment and Immigration Lloyd Axworthy's recent decision to assure that qualified Canadian candidates are given preferential consideration when new university faculty is appointed.

As one of the writers claims that "there are departments that claim up to 90 per cent non-Canadian staff", statistical information on the current hiring practices of Ontario universities, among them the University of Toronto, may be of interest to your readers.

In 1976, 83 per cent of new appointees to faculty positions were either Canadian citizens or landed immigrants at the time the offer of employment was made. By 1980 this figure had risen to 89 per cent and by the current academic year to 89.3 per cent. In real numbers this represents 75 non-Canadian or non-landed immigrant appointees of a total of 701.

Recognition of this evidence would do much, in Ontario at least, to dispel the idea that universities are not making every effort to hire Canadian faculty wherever there are qualified candidates.

*William Sayers
Director of Communications
Council of Ontario Universities*

Only Canadians Need Apply in the Nov./Dec. issue draws attention to an important matter. But perhaps university administrators and applicants will feel better if they know what their counterparts in the United States face. Should an American university decide to hire an "alien" it, and the candidate, must deal with not one but three government departments: state, justice and labor. None of these is especially speedy or responsive.

In short, free trade is not universal in academia; far from it. And the federal government does have a mandate to protect employment in Canada. While the two-stage procedure for advertising, as you

Letters may be edited to fit available space and should be addressed: Graduate Letters, Department of Information Services, University of Toronto, Toronto, M5S 1A1.

describe it, is cumbersome and its "Canadian content" stipulation offensive, I do not see how immigration officials can be expected to carry out their responsibilities without being given some account of why an unlanded non-Canadian was seen to be the best person for the job. What alternative do those who attack these regulations propose?

An insufficiently diligent, unimaginative, ill-informed search committee can end up hiring mediocrity, regulations or not. And if a Canadian university wants to hire the best molecular geneticist in the world I am quite sure that it will be able to do so, providing it is willing to pay the price, in salary and working conditions, that such a person would demand. I suspect that the real problem will be in paying the price — not in satisfying Employment and Immigration Canada.

*Allan Megill
Department of History
University of Iowa*

Re: Only Canadians Need Apply, Nov./Dec. issue. None of us likes bureaucratic meddling, and I can, to some extent, sympathize with the writer's concern over the intervention of the minister of employment and immigration in the hiring practices of Canadian universities. But given the degree of foreign domination of our post-secondary institutions, I personally can only wonder what took Mr. Axworthy so long. Those who will not regulate themselves ask to be regulated.

*Adele Ashby
Toronto*



PRACTICAL ASTRONOMY

I have just read, with a mixture of interest and amusement, Prof. Fernie's account (in the recent *Graduate*) of his tribulations in attempting to get a sight on the David Dunlap Observatory — that's "DDO" by the way — from the tower of the (new) McLennan Laboratories. I feel that I must point out, however, that had he stolen a few minutes to walk over to the north-east corner of the old McLennan Laboratories, now re-named the Sanford Fleming Building, and had taken a good look around, he might have saved himself considerable time and been spared much confusion

(and, perhaps, embarrassment), for there he would have found the "true north", cast in concrete!

That spot is the original site of the Toronto Magnetic Observatory, established in 1840 by the Imperial Government and dismantled in 1908 to make room for the new Physical Laboratories then under construction; the landscaping of that area has now been re-designed to commemorate that earliest of Upper Canadian scientific institutions. Specifically Prof. Fernie would have seen there the foundation for a concrete beam with a bronze strip (soon to be installed) which points to geographic north and thus shows by implication that "north-south" city streets in this district, such as St. George and Yonge, actually point about 16

degrees west of geographic north. (Magnetic north is something else again!)

The base line for this meridian-marking strip has been laid out (by the senior surveying staff of the Department of Civil Engineering, using a gyrocompass) to an accuracy of better than one per cent of the degree, so Prof. Fernie could have had complete confidence in its correctness. The length of the beam (to be divided into five equal sections) will be exactly 0.500 second of arc of latitude here. The present plan includes also a sundial which will show Apparent Solar Time for this longitude ($79^{\circ}23'42''$ west of Greenwich) with corrections for Eastern Standard Time, and Solar Declination for this latitude



Re: Only Canadians Need Apply, Nov./Dec. 1981. I say, "Good, Mr. Axworthy, you do well to stand up for the right of Canadians to have the first chance to apply for staff positions in our Canadian universities."

Everyone has known for decades that the cards were stacked against Canadians in this respect, as Canada was the only nation where its citizens were not given this privilege. Other countries use immigration laws to bar our people; but in Canada, "old-boy favouritism" has peopled our universities with a very high proportion of foreigners who bring in their friends. We taxpayers want our own children and grandchildren to be given a chance.

Mr. Axworthy is to be commended, not condemned for his action.

W.E. Steele
Forestry 2T7
Bradenton, Florida

Re: Thinking Small, Nov./Dec. issue. The existence of the quark has been known and appreciated prior to 1963. I can remember eating quark in Germany prior to 1963 (when we emigrated to Canada). I liked it especially well with strawberries or raspberries and a bit of sugar. It is the central European version of creamed cottage cheese, without the lumps or small particles. How far back it goes I am not sure, but to quote Goethe: "Getretner quark wird breit, nicht stark." Freely translated as: a weak argument does not become any stronger by discussing it at great length (or something along that vein).

Hubert S.

Signature indecipherable.
Editor.

In your editorial, Nov./Dec. 1981, you quote Arthur Kruger as saying:

(43°39'36" north of the equator), to relate to the work of the Observatory and to Sandford Fleming's efforts to introduce Standard Time. It is our hope that this total arrangement will create a point of interest in the middle of the University for passers-by with scientific and historic interests, and we expect lots of your readers to drop by when the work is complete.

So you see, Mr. Editor, that we engineers on campus know where to find the north star when we want it, even if some of our modern-day astronomers do not. "Practical" astronomy, we call it.

Thanks for an entertaining issue.

Ian R. Dalton
Department of Electrical Engineering

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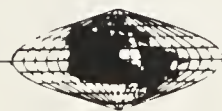
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THE SHAPING OF PEACE

CANADA AND
THE SEARCH FOR
WORLD ORDER

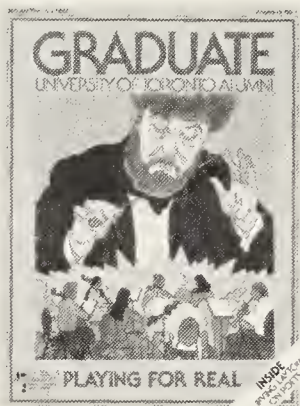
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University of Toronto Press



THANK YOU!

to the many readers who responded to our invitation to become voluntary subscribers to *The Graduate*. To those who intended and forgot, the invitation is still open. Send \$10 to The Graduate, Department of Information Services, University of Toronto, Toronto M5S 1A1 and mark it voluntary subscription.

"Governor Reagan hated the University of California, almost as an anti-intellectual. He wasn't out to destroy it, but he sure wasn't going to make things easy."

This statement is quite untrue. During Mr. Reagan's first term as governor of California, I was one of a group of University of California professors at Berkeley invited by Governor Reagan to meet at Sacramento with him. We had an open round-table discussion with him that lasted about half a day.

By contrast, the present governor of California is noticeably hostile towards the university.

Obviously, time and space do not permit me to expound on the history of what went on at Berkeley, 1965-1975, but the statement attributed to "an American colleague" is incorrect. Furthermore, we are not worried about "dropping below the level of Stanford".

Thomas H. Jukes
Professor of Biophysics and Medical Physics
University of California, Berkeley

I found the article, History and Hyperbole, in the Nov./Dec. issue of *The Graduate*, intriguing.

Do you know if the ancient writings say anything of a postal service? I am wondering if the change from clay tablets to a form of paper was due to an increase in postal rates.

F.W. Hanley, M.D.
West Vancouver

As one who has been associated with the Orchestral Training Program at the Royal Conservatory, I am happy to see that it is receiving the serious attention it so well deserves, as exemplified in the fine article in your most recent edition by Pamela Cornell.

I was surprised and distressed, however, to see that no mention whatever was made of my colleague Jane McDonald, who has been with the program from the beginning, as assistant co-ordinator during the first two seasons and this year as administrator, in full charge of the program's day-to-day operation. Jane's rare combination of administrative ability and humanity has had a great deal to do with making the program the success it has been. She cares about the participants, about their problems, their aspirations, their feelings, and she runs OTP with *them* in mind — you only have to ask musicians to find out how seldom

that is truly the case. She deserves a great deal of credit for her dedication to the program and to its aims and ideals, to say nothing of the uncounted hours beyond the call of duty that she has spent in its service.

I hope that you will print this letter to help correct in a small way the one unfortunate oversight in an otherwise well-researched and well-written report.

Philip Morehead
Musical Adviser
Orchestral Training Program

Congratulations on the high standards you maintain in *The Graduate*: "acceptable to the expert, interesting and intelligible to the ordinary reader". I marvel at the consistent excellence of your special articles — with one notable exception.

As a Canadian living happily, in retirement, in France, I was astonished and embarrassed by the silly things Linda Cahill wrote in *France Seriously*, published in your May/June issue last year, and I am grateful to Pierre Falquet for his restrained response which appeared in the Nov./Dec. issue. Why is it, I wonder, so many of us North Americans who go abroad for the first time write down anything we find different from what we have known at home as *ipso facto* inferior, without taking the trouble to understand it?

Ronald Fredenburgh, O.B.E.
Pellegrue, France

Enclosed please find a cheque for \$10 for *The Graduate* voluntary subscription. I realize graduates receive the publication free of charge but every little bit helps defray the cost somewhat.

I look forward to receiving the magazine and enjoy all the articles. *The Graduate* is the only way I am able to keep in touch with the University. Keep up the good work.

Ruth (Little) Sutton
Scarborough

I think I sent in my voluntary subscription but I cannot find an acknowledgement from you people.

I was intrigued by Pamela Cornell's article on the ancient writings of Mesopotamia. Could she do a follow-up on the language and the alphabet?

It was my understanding that our alphabet is founded upon the script of the Egyptian scribes. The Phoenicians adapted this cursive (I

believe) writing to their language. Then the Greeks, with their own adaptations, used the Egyptian/Phoenician script.

Miss Cornell's article is now enfolded in my treasured, long-since out of date, *Wonders of the Past*.

Edward F. Robinson
Oshawa

We would like to acknowledge each voluntary subscription when we receive it. However, the costs involved are far from negligible and we hope that our voluntary subscribers will forgive our apparent rudeness.
Editor.

I think it must be time to send my contribution for another year of *The Graduate*. I was very much interested in the story about the music at Sharon in the May/June issue and was able to attend one of the concerts there. Now I understand they are working to repair the wooden pipe organ and plans are under way for a festival in 1982.

Barbara S. Cooper
Coldwater

I enclose a cheque for \$10 as a voluntary subscription for *The Graduate*. I particularly enjoyed the article in the Nov./Dec. issue on the Mesopotamian inscriptions.

Edwin D. Eagle
Professor Emeritus of Classics
University of Winnipeg

Enclosed please find a contribution toward the cost of my receiving *The Graduate*. The magazine format is a vast improvement over the former newspaper-like edition.

I think the U of T bookstores would find a wide market by

advertising memorabilia with U of T insignia in *The Graduate*. The new society of large donors (the name presently escapes me) has the funniest looking mascot I've seen for some time. I'd buy a T-shirt with that emblazoned on.

Mary L. Cosgrove
Clinton, N.Y.

Enclosed is \$10, a voluntary subscription to *The Graduate*. I read every issue, most informative. I've learned more about U of T since I graduated than during the four years I was enrolled.

D. Michael Troy
Fairbanks

Bette Stephenson said you need \$25 from each alumnus-or-a each year. I think it is a splendid idea and am enclosing mine, plus the \$10 donation to *The Graduate*. Sorry I don't work for a firm that matches the amount.

It would be wonderful to have a university independent of the government.

Josephine Berthier
Niagara-on-the-Lake

Enclosed is my copy of the solution to *The Graduate* Test 14. These have filled a void since the cryptic crossword was dropped from *Saturday Night*.

Keep 'em coming!

Arleigh Tiers Smith
Perth

We probably receive our *Graduate* a few days later than Toronto residents. However, the *Graduate* Tests are great! I received my copy this morning and I'm sending it in even though it may be trailing correct

answers mailed in Toronto. After all, our new postal department can use another 30 cents.

M.J. Perry
Brantford

Actually, this was the first letter we opened for Test No. 14. However, since the draw for the winner is blind and by the time it is held we have no way of knowing which arrived first or last, the odds on winning will not change.
Editor.



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Unclaimed diplomas

If one of the many unclaimed May/June 1980 diplomas at Student Record Services, 167 College St., is yours, why not pick it up or have it sent to you by registered mail?

In the first case, you will need identification; if you send someone, a signed letter of authorization will be required.

In the second case, write to: Diplomas, Student Record Services, University of Toronto, Toronto M5S 1A1. Enclose a certified cheque or

money order for \$6 and provide all of the following information, typed or printed: graduation name; address; date of convocation; degree; faculty or school, college if applicable; student number. If your name has changed since graduation, please provide some proof of your former name.

All unclaimed May/June 1980 diplomas will be destroyed on Sept. 1, 1982. A replacement fee, currently \$30, will be assessed after that date.



ALUMNI NEWS/BY JOYCE FORSTER



WHERE HAVE ALL THE DROPOUTS GONE?

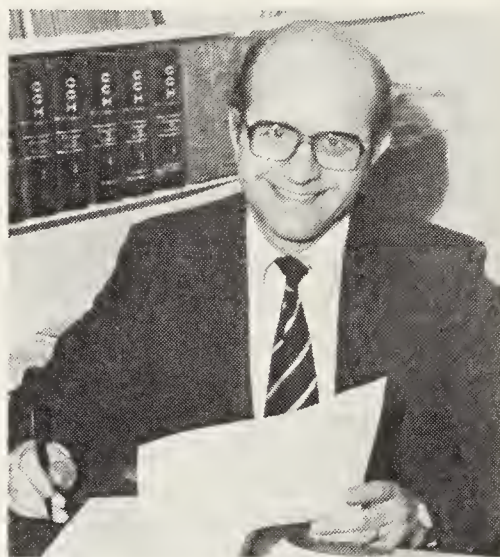
Enrolment at U of T last year was higher than anticipated so plans were made for a decrease this year.

The result? Enrolment is up four per cent to 40,422 full-time students. What's more, enrolment is up over the whole system. This year represents an all-time high. This heartening, if somewhat inconvenient, growth seems to have arisen from a higher-than-usual rate of acceptance, a lower-than-usual dropout rate, and an unexpectedly high enrolment of visa students in the first year of arts and science.

Nevertheless, even arts and science students (those in the largest division) remain individuals, not statistics, since our unique college system ensures that even at the largest, Victoria, students will find only about 3,000 members.

LEGAL ISSUES COMING

Frank Iacobucci, dean of law, and law alumni president Dick Potter (U.C. 6T2, Law 6T5) have pooled their considerable talents and energies to promote an expansion and renewal in the Law Alumni Association. An enthusiastic executive committee of 12 is considering a number of initiatives, the first of which will be a slick new magazine which should make its appearance by the end of March.



LASTING MEMORIAL

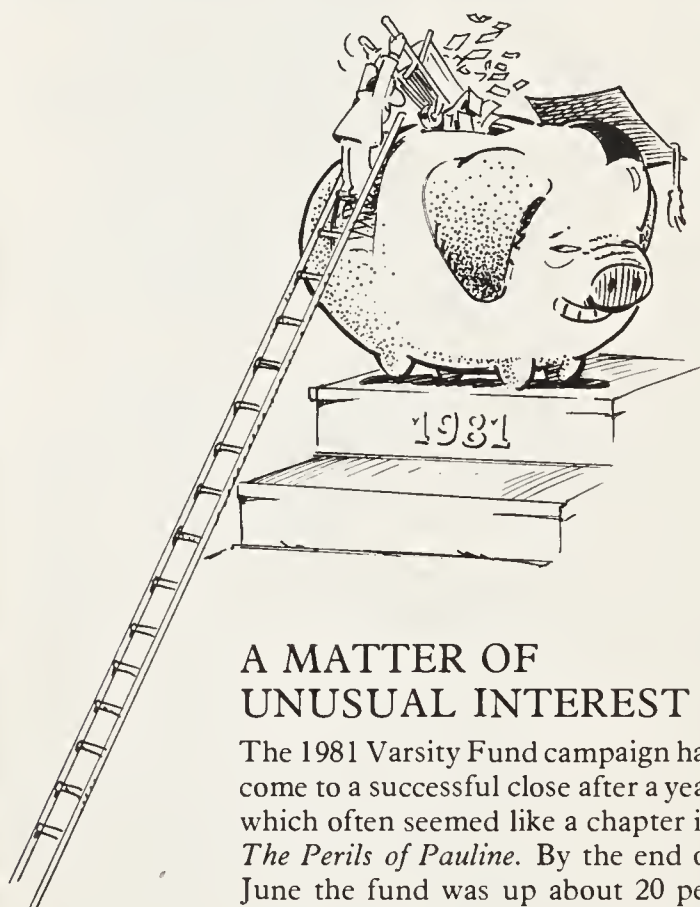
A new award and lecture series will honour the memory of Wilson Abernethy (Engineering 2T3), founder of the Senior Alumni Association.

The Senior Alumni Abernethy prize in gerontology at Woodsworth College has been funded with the interest the Senior Alumni Association has earned on the money it received from its CASE achievement award. The prize is valued at \$150 and two will be given in 1983; one each year starting in 1984.

The Anthes Wilson Abernethy lecture series in gerontology has been established with an annual grant of \$1,000 from Anthes Industries Incorporated of Mississauga, one of the companies Wilson founded. The first lecture will be given in April by Dr. George Maddox, director of the Center for the Study of Aging and Human Development at Duke University. This will also mark the inauguration of an exchange program in research, training and study between the U of T's Program in Gerontology and the Duke centre.

AN EXTRAORDINARY CAREER

Professor Emeritus Edna W. Park died in Toronto on Wednesday, January 27. She graduated from U of T with U.C.'s class of 1T7, continued with master's studies at Wisconsin and Columbia, and returned to Toronto to teach in the Faculty of Household Science for more than 50 years. Her outstanding contribution to the study of nutrition in Canada was marked by the Household Science Alumni Association in 1974 when they established an annual lectureship in her name.



A MATTER OF UNUSUAL INTEREST

The 1981 Varsity Fund campaign has come to a successful close after a year which often seemed like a chapter in *The Perils of Pauline*. By the end of June the fund was up about 20 per cent over last year, by November it was down 10 per cent. As of January 15, last date for 1981 contributions, it

was back up nearly 21 per cent. Conclusion: the initial lag, brought about by the postal strike, was extended when canny graduates decided to leave their money in high-interest accounts until the last possible moment.

Final figures (including the special appeal for Varsity Arena) showed \$1,239,332, up from \$1,021,465 in 1980; 18,656 contributors for a participation rate of 14.44 per cent over 17,132 and 12.12 per cent in 1980; and an average gift of \$66.43 compared to 1980's \$59.62. Satisfaction with these increases is somewhat muted by the fact that without the special Varsity Arena appeal the total would have been below 1980 and the average arena gift of \$71.63 from 3,451 donors improved the average gift figures.

Varsity Fund chairman Brian Buckles and his executive are currently holding discussions with the UTAA with the hope that mutually satisfactory revised terms of reference for the Varsity Fund will improve both performance and participation in the lean years ahead.

MORE ABOUT . . .

The state of continuing financial crisis at U of T means that almost all discussion sooner or later gets around to that dreary five-letter word "money". This was brought home to the UTAA directorate at the January meeting when two speakers brought the same message — it's bad, and it's getting worse. David Graham, director of the Advisory Bureau, a campus counselling service for students which also sponsors exam anxiety clinics and seminars teaching study skills, pleaded with directors to exert pressure to prevent the expected demise of the bureau on April 30. He believes such a closing would have serious consequences for emotionally troubled students who might not get help until they were seriously ill and that it will also increase the dropout and failure rate. Second speaker was Arthur Kruger, dean of arts and science, who restated what has been common knowledge on the campus for months — budget compression over seven years has squeezed out all the fat and a good deal of bone and muscle. We are now facing excision of programs with attendant shrinking of the University's fields of scholarship and narrowing of student choice. On the whole, an informative but grim evening.

CONSTITUTIONAL CHANGE

No crisis attended the Senior Alumni's adoption of a new constitution; it was primarily a matter of redesigning to accommodate phenomenal growth in programs and activities. It states: "The scope of the Senior Alumni Association, University of Toronto is:

1. to be a voice of experience and maturity in the university community and in the community at large;
2. to provide services for the

university in areas where financial restraints make these services otherwise unavailable;

3. to provide assistance to the UTAA;
4. to provide opportunities for senior alumni to serve the university;
5. to foster awareness amongst senior alumni of the need for financial support of the university by donations and bequests."

If you are 60 years of age or over and think that sounds like a program you could support, call Bill Gleberzon at (416) 978-8991.

DEMOCRACY IN ACTION

Young Alumni president Cathy Donald reports the association continues to flourish but is wary of losing touch with its constituency. An open executive meeting on January 21 in Hart House was designed to give all members an opportunity to produce fresh ideas for future social, cultural and educational activities.

A meeting with student leaders is planned for March. It should offer the association the opportunity of acquainting soon-to-be alumni with its program and finding out how young alumni can contribute to, and enrich, undergraduate life. The athletic programs, jazz dance classes

and legal lectures on family law, consumer and tenancy rights have all been well supported and will undoubtedly be continued.

If you have graduated in the last 10 years and would like to know how to get involved, call Glenna Sims at (416) 978-8990.

Canadian Perspectives, Spring 1982

An informal, academically-oriented lecture and discussion series for senior alumni and friends will be presented in the media room (179) of University College.

Series 1, Wednesdays, 9.30 a.m. to 12 noon, April 7 - May 5

Prof. P.R. Leon, French and Spanish: Did Columbus Discover America?

Prof. Timothy Colton, political economy: Politics of the Soviet Union.

Geoffrey Adamson: The Innovations Foundation of the U of T.
Prof. C.M. MacLeod, psychology: Learning, Memory and Intelligence.

Audrey Hozak: Hart House: Its Past, Present and Future.

Series 2, Mondays, 1.30 to 3.30 p.m., April 5 - May 3

Prof. N.P. Zacour, medieval studies: The Bayeux Tapestry.

Dr. H.C. Stancer, psychiatry: Mental Depression.

Vice-President D.G. Ivey: Institutional Relations at the U of T.

Prof. P.H. Russell, political economy: Canadian Politics.

Prof. Ben Schlesinger, social work: Why Marriages Last.

Registration fee \$15 per person per series. Please make cheques payable to UTAA — Senior Alumni.

For further information or to register: Department of Alumni Affairs, 47 Willcocks St., University of Toronto, Toronto, M5S 1A1; telephone (416) 978-8991.

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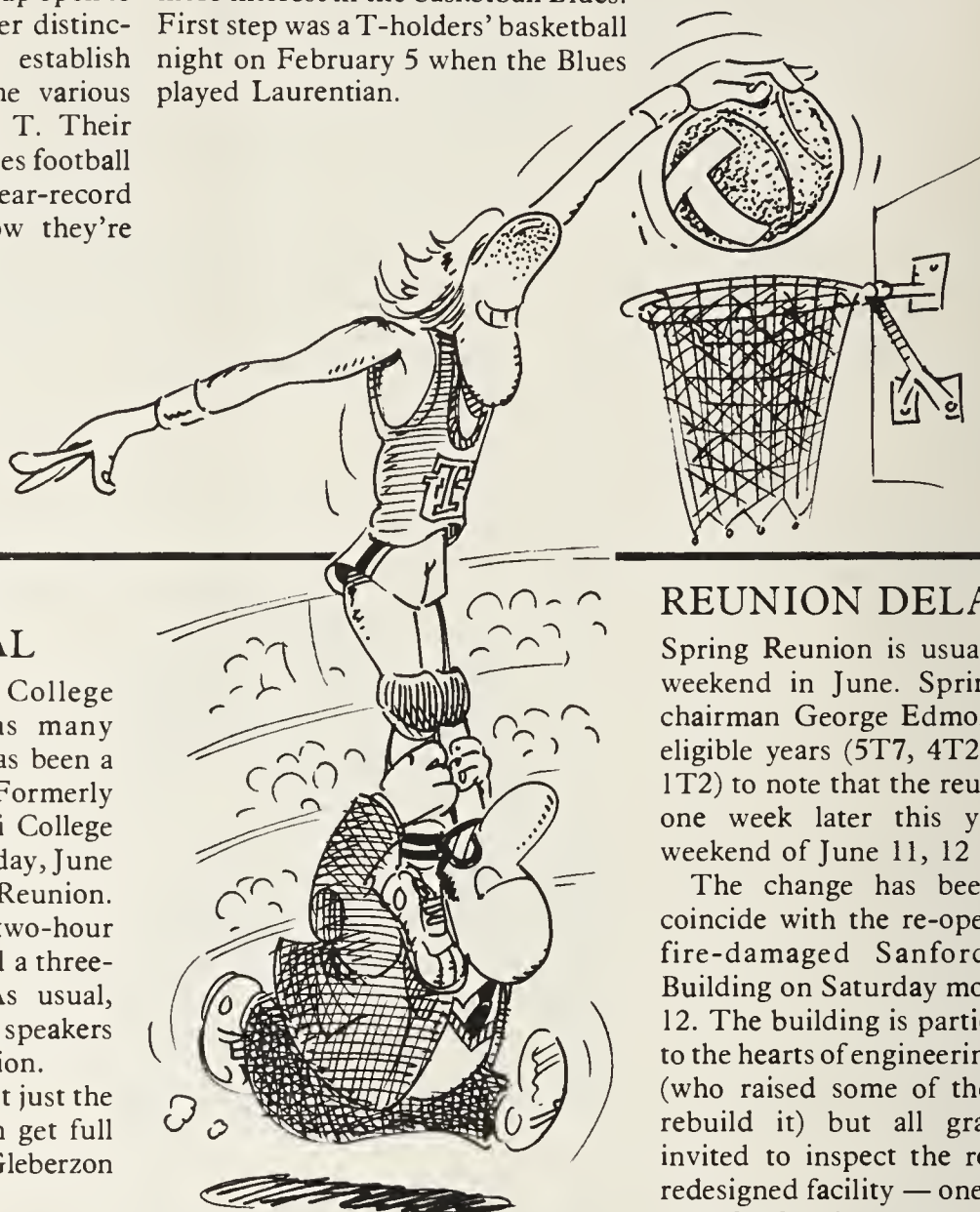
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"T" STANDS FOR TERRIFIC

The T-Holders' Association, the special-interest alumni group open to holders of that sought-after distinction, has undertaken to establish supporting groups for the various teams representing U of T. Their efforts on behalf of the Blues football team last fall produced a near-record Homecoming crowd. Now they're

working on basketball. A group of basketball T's is holding meetings to discuss ways and means of generating more interest in the basketball Blues. First step was a T-holders' basketball night on February 5 when the Blues played Laurentian.



DISTANT EARLY WARNING SIGNAL

To make the Alumni College program accessible to as many alumni as possible, there has been a change of time and format. Formerly an entire weekend, Alumni College will be held this year on Friday, June 11, the first day of Spring Reunion. The program will have a two-hour morning session, lunch, and a three-hour afternoon session. As usual, there will be outstanding speakers and ample time for discussion.

It's open to all alumni, not just the reunion years, and you can get full information by calling Bill Gleberzon at (416) 978-8991.

MAGNA CUM LAUDE

Each year the Faculty Liaison Committee of the UTAA invites the provost, the president of the Faculty Association and the presidents of the various student associations (SAC, APUS, and the GSU) to join it for consideration of nominees for the annual Alumni Faculty Award. By the time you read this they will have selected another outstanding candidate who "combines distinction in her/his discipline with service to the university and the community".

The award dinner will take place in the Great Hall of Hart House on March 31, a change from the original date of April 7, and all alumni are welcome. Previous winners were Horace (now Mr. Justice) Krever, the late Douglas Pimlott, Louis Siminovitch, John Polanyi and Donald Chant. Last year's winner was the inimitable Stefan Dupré. Regulars know they can expect an evening of rare good company and intellectual delight. A call to (416) 978-2367 will reserve tickets.

REUNION DELAYED

Spring Reunion is usually the first weekend in June. Spring Reunion chairman George Edmonds asks all eligible years (5T7, 4T2, 3T2, 2T2, 1T2) to note that the reunion will be one week later this year — the weekend of June 11, 12 and 13.

The change has been made to coincide with the re-opening of the fire-damaged Sanford Fleming Building on Saturday morning, June 12. The building is particularly dear to the hearts of engineering graduates (who raised some of the money to rebuild it) but all graduates are invited to inspect the restored and redesigned facility — one of the most graceful facades on campus.

GRADUATES AND ALUMNI VICTORIA COLLEGE, EMMANUEL COLLEGE

Important Notice of Board and Senate Elections 1982

Nominations are invited for graduate and alumni representatives on the Board of Regents and on the Senate of Victoria University for terms of four years. The following representatives are to be elected:

Eight members of the Board of Regents by the graduates in arts and science of Victoria University.

Five members of the Board of Regents by the alumni of Emmanuel College.

Ten members of the Senate by the graduates in arts and science of Victoria University.

Six members of the Senate by the alumni of Emmanuel College.

Nomination is by letter addressed to the registrar and signed by five graduates or alumni. The present address and occupation of the nominee should be given, together with a brief biographical sketch of not more than 75 words.

Letters of nomination should be sent to K.R. Thompson, A.M., Registrar, Victoria University, 73 Queen's Park Crescent East, Toronto, M5S 1K7.

Nominations will be received up to 5 p.m. on Friday, April 30, 1982.

MESOPOTAMIA, JAZZ & RETIREMENT PLANNING

LECTURES

Some Aspects of the Contribution of the Scanning Electron Microscope to Bio-Medical Research.

Wednesday, March 31.

Prof. Alan Boyde, University College, London; SGS Alumni Association lectures. Place to be confirmed. 8 p.m.

Information: Faculty of Dentistry, 978-6292.

Preparation for Retirement Living.

Tuesdays, April 6 to May 18.

Seven-week program for alumni who have recently retired or are about to retire.

Retirement is a Challenge. Greta Riddell-Dixon, Ryerson Institute of Technology.

Health in Retirement. Susan Kober, general practitioner.

Housing Alternatives. John Moses, real estate specialist.

Legal Matters of Interest to Seniors. Norman Epstein, barrister and solicitor.

Community Resources for Seniors. Janet Duke, Community Information Service.

Your Financial Resources. W.G. Upshall, investment counsellor.

The Use of Leisure Time. Morley Zurbrigg and Allan Upshall.

All lectures will be given at 162 St. George St. from 7.45 to 9.45 p.m. and are open to alumni and friends.

Registration fee \$20; cheques payable to "U.T.A.A. — Senior Alumni".

Please register in advance as enrolment is limited.

Information and registration: Department of Alumni Affairs, 47 Willcocks St.; 978-8991.

Society for Mesopotamian Studies.

Wednesday, April 14.

Caravans and Trade in Ancient Mesopotamia and Asia Minor. Prof. Mogens Trolle Larsen, University of Copenhagen.

Wednesday, May 5.

Preliminary Report on Recently Discovered Cuneiform Inscriptions. Fawzy Rashid, Iraq Museum, Baghdad.

Lectures will be at 8 p.m. in the

Details given were those available at press time. Readers are advised to check with the information telephone numbers provided in case of changes. Enquiries by mail should be addressed to the department concerned, University of Toronto, Toronto, M5S 1A1, unless otherwise indicated.

Medical Sciences Building, room to be confirmed.

Information, 978-4769.

The Future of Aging.

Monday, April 26.

Dr. George Maddox, Duke University Medical Center; first Anthes Wilson Abernethy lecture. Place to be confirmed. 8 p.m.

Information: Program in Gerontology, 978-4706.

MEETINGS

Young Alumni Symposium.

Saturday, May 8.

Meeting of constituency alumni associations to discuss how to get young alumni involved. Meeting Room, Hart House. 9 a.m. to 12 noon.

Information: Department of Alumni Affairs; 978-8990.

Household Science Spring Symposium.

Saturday, May 8.

Annual spring symposium and luncheon to be followed by Household Science Alumni annual meeting; Dr. Elizabeth Bright-See, Department of Medicine, will be featured speaker. Debates Room, Hart House. 8.30 a.m. to 2.30 p.m.

Information: Doris Pritchard, 221-4774.

Canadian Association of African Studies.

Tuesday to Friday, May 11 to 14.

Conference sponsored by the African Studies Program and African Studies Committee of the Centre for International Studies. Topics to be discussed include the state in pre-colonial and colonial Africa, African

fiction and theatre, peasants and political change, labour history and demography. All sessions will be held in University College. Exhibition of contemporary African art will be mounted in the Croft Chapter House, University College for duration of conference.

Information and program: Department of History, 978-3758.

CONCERTS

HART HOUSE

Thursday, April 1.

Tsuyoshi Tsutsumi, cello. Great Hall. 8 p.m. Sponsored by the Community Relations office and the Japanese Consul General.

Information, 978-2436.

EDWARD JOHNSON BUILDING.

U of T Symphony Orchestra.

Saturday, April 3.

Conductor Victor Feldbrill, with U of T Concert Choir. Program includes Symphony No. 2 in C minor ("Resurrection") by Mahler.

MacMillan Theatre. 8 p.m.

Tickets \$3, students and senior citizens \$1.50.

Orchestral Training Program.

Saturday, April 17.

Conductor Eleazar de Carvalho.

MacMillan Theatre. 8.15 p.m.

Tickets \$3.50, students and senior citizens \$2.

Information, Royal Conservatory of Music, 978-3771.

Eighth Annual Remenyi Award Competition Finals.

Sunday, April 25.

Annual competition that started over 50 years ago in Budapest and was revived at the Faculty of Music seven years ago. House of Remenyi, distinguished Hungarian music firm now located in Toronto, will contribute a new instrument built by a contemporary Hungarian luthier. Preliminary sessions will reduce the number of participants in the finals to a small group of Faculty of Music string students. Walter Hall. 3 p.m.

Information on all concerts in Edward Johnson Building available from box office, 978-3744.

ROYAL CONSERVATORY OF MUSIC

Twilight Concert Series.

Thursday, April 1.

Patricia Morehead, oboe, Philip Morehead, piano, and Margot Rydall, flute.

Thursday, April 15.

Deborah Szabo-Gale, piano.

Thursday, April 29.

Zenia Kushpeta, piano.

Concert Hall. 5.15 p.m.

Noon-hour Concert Series.

Wednesday, April 7.

Joyce Gundy, violin.

Wednesday, April 21.

Laurie Evan Fraser, piano.

Wednesday, April 28.

Brenda Baranga, piano.

Concert Hall. 12.15 to 1 p.m.

Ensembles Sunday Concert Series.

Sunday, May 9.

Victor Danchenko, violin, in concert with the Conservatory Strings. Program of works by Debussy,

Tchaikovsky, Ysaÿe and Haydn.

Concert Hall. 8.15 p.m.

Admission \$2. Proceeds go to Royal

Conservatory of Music Scholarship

Fund; contributions in excess of \$10 will receive a receipt for tax purposes.

Information on all concerts at Conservatory available from publicity office, 978-3771.

VICTORIA COLLEGE

Victoria Women's Association.

Wednesday, April 28.

Iris French, piano, and Margaret Carmichael Bond, contralto.

Wymilwood. 2 p.m.

Information: Miss Kay Eaton, 489-8498.

EXHIBITIONS

Erindale College.

March 15 to April 9.

Spring Forward. Annual exhibition of work by students in U of T/ Sheridan College co-operative program in art and art history.

Gallery hours: Monday-Friday, 10 a.m. to 9 p.m.; Saturday-Sunday, 2 to 5 p.m.

Hart House.

March 30 to April 16.

David Turney, sculptures.

April 20 to May 7.

Monique Cliche Spenard, quilts.

Gallery hours: Monday, 11 a.m. to 9 p.m.; Tuesday-Saturday, 11 a.m. to 5 p.m.; Sunday, 2 to 5 p.m.

Scarborough College.

April 5 to 23.

Annual juried student show.

Gallery hours: Monday-Thursday, 9 a.m. to 7 p.m.; Friday, 9 a.m. to 5 p.m.; Sunday, 2 to 5 p.m.

Robarts Library.

May 3 to 30.

African Studies. Crafts, sculptures and textiles. Main display area.

PLAYS & OPERAS

Trinity College.

March 31 to April 10.

Two Tudor comedies, produced by Poculi Ludique Societas. Seeley Hall. Tickets \$3, students and senior citizens \$2.

Information, 978-5096.

Scarborough College.

April 1 to 3.

"Hippolytus" by Euripides, presented by Scarborough College drama students. TV Studio 1 at 8 p.m. *Information, 284-3243.*

MacMillan Theatre.

May 13, 15, 26, 28 and 29.

Programs of opera excerpts. Final productions by Opera Division, 1982 season. Performances at 8 p.m.

Unreserved tickets available at \$2 from box office from 5 p.m. on evening of performance.

Information, 978-3744.

MISCELLANY

Vincent Bladen Memorial.

Thursday, March 11.

Special program. President Donald Forster, University of Guelph, will give the Bladen memorial lecture in Seeley Hall, Trinity College, at 4.30 p.m. A celebration with tributes by Prof. Claude T. Bissell, Prof. Lorie Tarshis, and a representative of the National Ballet School, music by the Toronto Boys Choir, will be held in Convocation Hall at 8 p.m.

Information: J.S. Mill Project, 978-4155.

Alumni-Faculty Award Dinner.

Wednesday, March 31.

Seventh winner of Alumni Faculty Award will be speaker at dinner; Moss Scholarships will be awarded. Great Hall, Hart House. 6.30 p.m. Ticket price to be confirmed.

Information: Department of Alumni Affairs, 978-2367.

Mississauga Citizen of the Year Award.

Sunday, April 25.

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Where are they now?

The University tries to keep in touch with its alumni for a variety of reasons, for example, to ensure that they receive *The Graduate*. However, we have lost contact with many of them because we do not have their *current addresses*. If you know the whereabouts of anyone on the following list, could you please send the information to Alumni Records, 47 Willcocks St., University of Toronto, Toronto, M5S 1A1, or telephone 978-2139. Your assistance will be appreciated.

Faculty of Medicine
Post-Graduate Medical Education
 Allan L. Staiman, PhD (76)



John Ross Stephenson, PhD (71)
 William Russell Thorpe, MSc (70)
 Mary I. Toth, MSc (79)
 L.C. Villalba-Pimentel, MSc (75)
 Charn Wing Wan, MSc (77)
 Andrew J. Wyrobek, PhD (75)
 Allan J. Yates, PhD (72)

Diploma in Medical Radiology — Therapy

James Ming Szeto (71)
 Siong K. Tan (64)

Diploma in Psychiatry

Manuel Saker (43)
 Henry G. Stratton (46)
 Yutaka Wakabayashi (64)
 Edward Michael Waring (72)

We would like to thank all who answer these requests. We are grateful for your help.

Third annual award, sponsored by Erindale College Alumni Association, Mississauga City Board of Trade and *Mississauga News*. Credit Valley Golf and Country Club. 12 noon. Tickets \$20.

Information and tickets, 828-5214.

Tea and Fashion Show.

Wednesday, May 5.

Women's Auxiliary of the University Settlement, annual fund-raising tea in aid of summer program.

Walk-through fashion show will be

presented by Patricia White at 1.30 and 3 p.m. President's house, 93 Highland Ave. 1 to 4.30 p.m. Rosedale bus stops at door. No tickets necessary, donations at door.
Information: Mrs. W.D. Foulds, 481-1754, or Mrs. J.H. Sword, 656-5876.

Dental Hygiene 5T8.

Wednesday to Friday, May 12 to 14.

Class reunion will be held in conjunction with Canadian Dental Hygienists' Association annual

meeting in Toronto.

Information: Margaret E. Miller, 340 Overdale St., Winnipeg R3J 2G4.

Run for Research.

Sunday, May 16.

Road race, 10 km., starting and finishing in vicinity of Sunnybrook Medical Centre. Proceeds to support medical research at hospital. Prizes for order of finish as well as lottery prizes for registrants who are encouraged to obtain sponsors to pledge per km. run. Registration fee to be confirmed.

Information, 486-4776.

Open House.

Thursday to Saturday, May 20 to 22.

Art work of the Art as Applied to Medicine program will be on display. Third floor, 256 McCaul Street. Thursday, 12 to 9 p.m.; Friday, 8.30 a.m. to 5.30 p.m.; Saturday, 10 a.m. to 4 p.m.

Information, 978-2659.

CONVOCATIONS

Trinity College Divinity.

Wednesday, May 5.

Strachan Hall. 8.30 p.m.

Information, 978-2651.

Emmanuel College.

Thursday, May 6.

Convocation Hall. 8 p.m.

Information, 978-3811.

Wycliffe College.

Monday, May 10.

Sheraton Hall, Wycliffe College.

8 p.m.

Information, 979-2870.

Knox College.

Wednesday, May 12.

Convocation Hall. 8 p.m.

Information, 978-4500.

Part-time master's program

The School of Graduate Studies will continue offering an expanded part-time master's program in the evening in 1982-83, beginning in September. In response to a perceived need, the expansion has taken place primarily in:

Division I — Humanities (classical studies, comparative literature, drama, East Asian studies, English, French, German, history, history of art, history and philosophy of science and technology, Italian studies, Near Eastern studies, philosophy, religious studies, Slavic languages and literatures, South Asian studies and Spanish and Portuguese)

Division II — Social Sciences (anthropology, criminology, education, geography, industrial relations, library science, management studies, political economy and sociology)

Programs already offered in other divisions of the school will not be affected. If you are interested in other areas of study, please contact the admissions office of the school. However, disciplines requiring extensive laboratory work are not presently able to accommodate students wishing to study part-time in the evening.

All general and departmental admission requirements will apply to the expanded part-time program. The admission deadline is flexible but it is suggested that you get in touch with the school as soon as possible and check with the department concerned to ensure that courses are available.

For more information, please call the enquiry desk at the School of Graduate Studies, 978-6614.

THE GRADUATE TEST NO. 15

The winner of The Graduate Test No. 13 in the Nov./Dec. issue was Frances C. (Smyth) Errington of Elizabeth, N.J. A copy of *The Craftsman's Way* has been sent to her. We received a total of 386 entries.

For Test No. 15 the University of Toronto Press has generously provided a copy of the *Encyclopedia of Music in Canada* edited by Helmut Kallmann, Gilles Potvin, and Kenneth Winters. It contains more than 3,100 articles on Canada's music and musicians of every type and is illustrated throughout with pictures of people, places, scores, programs, and sheet music.

Entries must be postmarked on or before April 30. The solution will be in the May/June issue, along with the winner of Test No. 14 from

Jan./Feb. The winner of Test No. 15 will be in the Sept./Oct. issue.

Address entries to: The Graduate Test, Department of Information Services, University of Toronto, Toronto, M5S 1A1. And please don't forget to include your name and address.

ACROSS

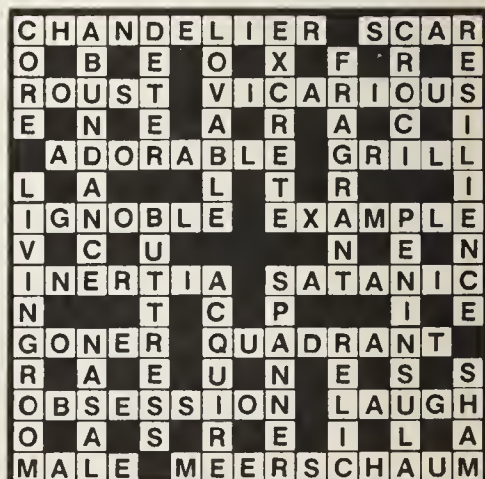
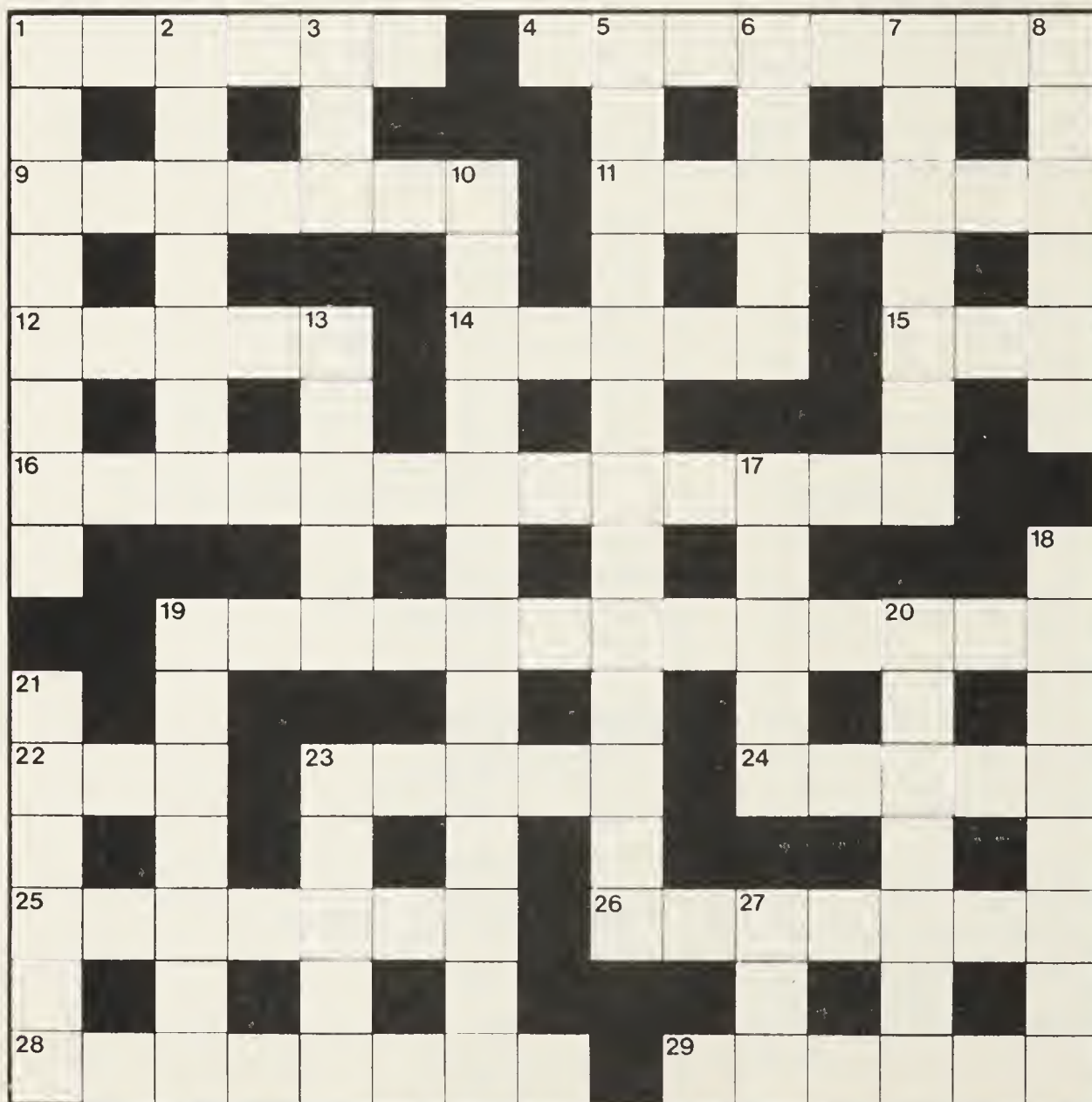
1. Motive concerning an unfinished aria? (6)
4. Householder sees trophy held by accountant in Ontario (8)
9. The lady will phone back for varnish (7)
11. Yielding open fabric (7)
12. Regulation about bishop making money (5)
14. Daring to leave inner vestibule (5)
15. Right after first class song (3)

16. Cannot be imagined in criminal with terrible vice: the French follow a sailor (13)

19. Check flower for new life (13)
22. Piano work is a hit with kids (3)
23. Moulds a happy soldier (5)
24. End of record about morning vision (5)
25. Perhaps Montagnes returned to take one in Kenya (7)
26. The French labour association and French pamphlet (7)
28. Putting up with (and in sharp pain) (8)
29. Drama editor gave a recital? (6)

DOWN

1. Hold back when the others precipitate (8)
2. Breccia, when crumbled, is bitter (7)
3. Some follow little night creature (3)
5. Disputatious one is clergyman sent back in command (13)
6. Release aunties' heart (5)
7. Shake it in stone (7)
8. First bit of good found in ranks of felines (6)
10. Patronizing behaviour so ensconced in organization (13)
13. Weariness points to Greek letter "i" (5)
17. Uninteresting, second class country (5)
18. Lively creature without a tail, Edward (8)
19. Salesman (CIL) sent back a copy (7)
20. The best way — without doing anything about spilt ale (7)
21. Bones from southern trees (6)
23. Car containing jack inlet (5)
27. A 50-50 totality (3)



A photograph of a man wearing a thick, dark fur hood, looking directly at the camera. He is holding a square piece of white paper in front of his chest with both hands. The paper displays a colorful, stylized illustration of a landscape. The artwork features a blue sky, a dark brown mountain range, and a foreground with a winding path or river. Several small, dark, stylized figures are depicted along the path. The background of the photograph shows a snowy, rocky landscape.



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